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The IRON AGE

SEPTEMBER 2, 1948

COLD ROLLED STEEL STRIP

Thomas Strip

UNCOATED AND COATED FINISHES

• ELECTRO-COATED ZINC, COPPER, NICKEL AND BRASS..HOT DIPPED TIN AND SOLDER..LACQUER COATED IN COLORS..UNCOATED PRECISION STRIP ..CARBON AND ALLOY SPECIALTIES

ECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

HE THOMAS STEEL COMPANY

WARREN OHIO

HOME RUNS WITH A FRYING PAN

WITHOUT the right equipment you can't get to first base . . . either in baseball or in business. Plants that handle materials with "frying pan" equipment are indulging in an expensive luxury, whether they realize it or not.

Plant studies show, time after time, that a properly designed Overhead Traveling Crane is the cheapest way to handle heavy, bulky materials quickly and efficiently without disturbing workers on the floor. It requires no aisle space and no floor maintenance.

Let Whiting's experienced crane engineers make a study of your materials-handling needs and recommend a Whiting Crane engineered to your individual plant conditions.

IMPORTANT

Whiting has acquired the patents, manufacturing, and sales rights to Spencer & Morris Tramrail Systems. These, combined with Whiting Hoists, Light Cranes, and Heavy Cranes, enable Whiting to supply a complete, fully integrated overhead materials-handling system.

WHITING CORPORATION

15601 Lathrop Ave. **Harvey, Illinois**

Offices in Chicago, Cincinnati, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, and St. Louis. Agents in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

Dependable · · Quiet-Running · · Durable

WHITING

Overhead Traveling **CRANES**

BUILDERS OF QUALITY CRANES

FOR OVER 60 YEARS

friendly rivalry keeps us *keen*....

We of the Barium corporate neighborhood compete with each other in a friendly sort of way to produce the best products and provide the best possible service to our customers, but we work together *as one team* whenever our skills and facilities are needed to do a complete job.

The Barium group has the most modern facilities, strategically located, to produce a wide range of steel products, from raw material to finished fabrication. Consult Barium, addressing any subsidiary in the field of your interest.

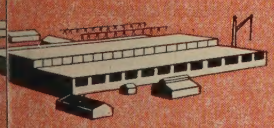
WE MELT, ROLL, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

ONE OF THE 16 BARIUM GOOD NEIGHBORS

SHEFFIELD IRON AND STEEL COMPANY

Subsidiary of Barium Steel Corporation

SHEFFIELD, ALABAMA



Producers of gray iron castings weighing up to five tons and King Ferronite Lighting Standards. Completely self-contained plant includes pattern shop, core room, and machine shop, with a capacity of 600 tons of commercial castings per month.

Barium STEEL CORPORATION

STEELWRIGHT TO THE NATION

BARIUM STEEL CORPORATION

EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

AMERICAN STEEL TRACTOR CORP., *Canton, Ohio* • CLYDE IRON WORKS, INC., *Duluth, Minn.* • CENTRAL IRON AND STEEL COMPANY., *Harrisburg, Pa.* BARIUM STEEL & FORGE, INC., *Canton, Ohio* • BARIUM EQUIPMENT CORP., BARIUM STEEL EXPORT, INC. • BAYONNE BOLT CORP., *Bayonne, N. J.* THE CUYAHOGA SPRING COMPANY, *Cleveland, Ohio* • THE GEOMETRIC STAMPING COMPANY, *Cleveland, Ohio* • PERMA-JACK CORP., *Cleveland, Ohio* PORCELAIN STEELS CORP., *Cleveland, Ohio* • THE DETROIT STEEL CASTING COMPANY, *Detroit, Mich.* • SHEFFIELD IRON & STEEL CO., *Sheffield, Ala.* KERMATH MANUFACTURING COMPANY, *Detroit, Mich.* • KERMATH (CANADA) LTD., *Toronto, Ontario, Canada* • REPUBLIC INDUSTRIES, INC., N. Y. GLOBE FORGE, INC., *Syracuse, N.Y.* • ERIE BOLT & NUT COMPANY, *Erie, Pa.* • WILEY MANUFACTURING COMPANY, *Mountville, Pa., and Port Deposit, Md.*

. . or a pound

of feathers?

Which is heavier, a pound of steel or a pound of feathers? —most youngsters have been puzzled in their day by this hoary old catch question.

So let us pose another one—"Which is the more, a pound of steel or a pound of steel?"

If it is high speed steel that you are buying, the answer is:

a pound of Molybdenum steel

For it is a fact that with Molybdenum high speed steels you get more tools from a given weight of steel—6% to 9% more. Since Molybdenum high speed steel is also considerably cheaper, you can make substantial savings in the cost of tools by using Molybdenum types.

And the performance?

On actual cutting performance the Molybdenum steel competes at least equally with similar tools of tungsten steel. Many makers and users claim *better* performance.

Climax Molybdenum Company
500 Fifth Avenue · New York City

MAIL THIS COUPON

Please send me a copy of your FREE BOOKLET

Name .....

Company .....

Address .....

MOLY

HS.3

Fatigue Cracks

BY C. T. POST

The Little Horses

• • For some time now a wild hair has been sprouting in, of all places, the advertising sections of British industrial magazines. The American reader, conditioned to maverick hucksterisms, reacts to the advertisements of Desoutter Bros. Ltd. with the same airy sensation received when a skyscraper elevator drops ten stories a second. When the first Desoutter advertisement appeared among the stiff bosomed business announcements several years ago, no doubt British industrialists could only utter a weak "Coo!" and ring for Pims, fast.

The Desoutter advertisements, for the most part, are inhabited by a bland old gentlemen with a walrus moustache possible only in fairy tales and some horse-headed characters known lovingly as "the little horses." The little horses live in Desoutter power driven tools. The things the old gent says and the things the little horses do will cause an erection of your forelock. To quote the advertisement shown:

Horses de Combat

"All over the country—said a leading diagnostician—eager workers are falling at their benches in a state of cocoa . . . pardon—coma. Such collapses occur after prolonged spells of repetitive, monotonous, although not necessarily arduous work. The Victim is usually well nourished (in the Works Canteen) and there is little indication that the exertions of the 5-day week are too much for him. What, then, is the explanation? I direct your attention to the archaic implement (A screwdriver—Ed.) clutched in the patient's hand. FRUSTRATION, gentlemen (cried the digno—the diagono, the dingo — the whoosit) — MANIPULATIVE FRUSTRATION* (he boomed) has brought on an acute fit of nervous debility. The remedy for such complaints is simple—call up the LITTLE horses.

*MANIPULATIVE FRUSTRATION a new industrial disease thought up by our advertising chaps. The cure is to use power driven tools in place of handtools. But the tools *must* be powered by Desoutter's Little Horses or what's the point of advertising."

Frank T. Sisco, whose work with the Alloys of Iron Research requires perusal of the foreign technical press, finds the little horses running harness races in his dreams. "Is this British humor?" he asks. "If not, what is it? Why do they spend money for it?"

To questions one and two, yes. To question three we can only say "Coo" and ring for Pims.

Cast

• • Some years ago, as the Alsop brothers recently related in their syndicated column, a party of American botanists was allowed to visit one of Russia's leading agricultural experiment stations. The visitors were bowled over when a dish of tomatoes, each as big as a cantaloupe, was displayed. One of the Americans quietly liberated a sample, only to find it was wax.

This brought to mind the early articles on continuous casting published by your favorite family journal back in 1935 and 1936. To Lippert, the Dr. Johnson of the process, left some doubt in these accounts as to whether Laing or Bessemer had first conceived the evolutionary hump in the steel making process. Less than a year later, J. G. Kullatschic of Russia's Sickle and Hammer plant cleared up these doubts, claiming credit himself. He wrote a scholarly article in which the data and pictures were authentic—they had been lifted bodily from your f.f.j., without credit.

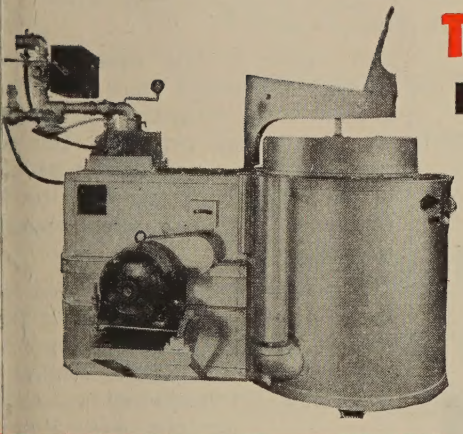
Tom recalled the incident in his colorful account two weeks ago which traced continuous casting of steel through adolescence, and described in detail Babcock & Wilcox' equipment at Beaver Falls, Pa. The day this latest article appeared, newspaper accounts hailed the B. & W. development and steel stock prices bounced in Wall St. Meanwhile, we couldn't help wondering whether, in some Beaver Falls behind the Urals, Russian scientists hadn't stolen the "secret" of the process so they could use it to continuous cast wax tomatoes.

ERE'S OW...

LINDBERG CYCLONE FURNACES

TEMPER SCREWS AT $0.000 093 6

FUEL COST PER POUND



Lindberg Steel Treating Co., Chicago, the world's largest custom heat treating organization and companion company to Lindberg Engineering Co., uses twenty-nine 100% forced-convection Lindberg Cyclone Furnaces for low-cost production tempering of many jobs—from tiny screws to 4 ton charges of forgings.

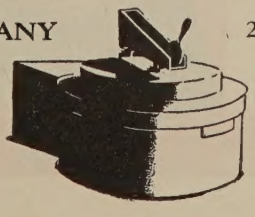
Here is one typical job, self-tapping screws tempered in one of the nine furnaces shown above (the third one from the front—it has a work chamber 22" in diameter by 26" in depth). Note the low unit cost.

FUEL COST	$0.000 093 6 PER LB.
Weight of charge	1019 lbs.
Temperature	600° F.
Time in furnace	65 minutes
Fuel consumed	159,000 BTU (1.59 Therms)
Fuel cost @ 6c Therm	9½c

Hardness is easily controlled to plus or minus 1 Rockwell "C." Heating is rapid and uniform. Heat is generated in a *separate* chamber away from the charge, *then* circulated by blower through all parts of the work chamber. All work is uniformly heated at the same instant—radiant heat does not reach outside of charge first . . . and center last.

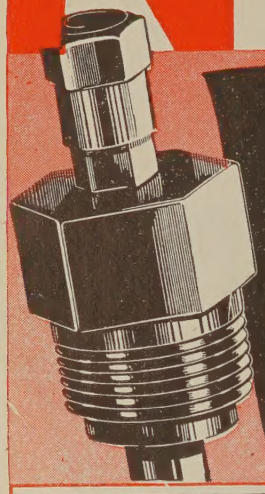
indberg Cyclone Furnaces can help re- e the costs and improve the quality of r tempering, annealing, nitriding, stress- eving and non-ferrous heat-treating. letin 53, *"Lindberg Gas Fired Cyclone npering Furnaces,"* tells how. Ask for (Bulletin 14 covers *Electric Cyclones.)*

LINDBERG ENGINEERING COMPANY 2452 W. Hubbard Street, Chicago 12, Illinois



LINDBERG FURNACES

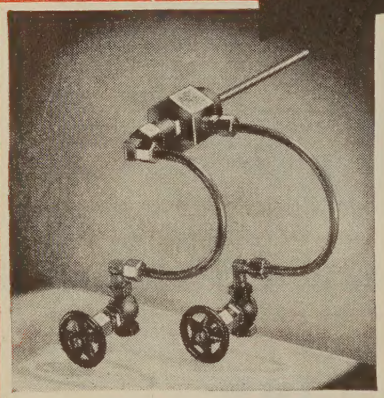
NOW



AVERT PLANT SHUTDOWNS!
HAVE 2 FUELS AVAILABLE!

OIL STANDBY EQUIPMENT

—inserted in 'Surface' High and Low Pressure Types Gas Burners feature quick change-over—
GAS-TO-OIL and OIL-TO-GAS.



EASY TO INSTALL—change-over gas-to-oil and oil-to-gas is a matter of seconds for most installations.

PREVENTS LOST TIME

● Proved in 159 furnace installations —1100 burners, during winter of 1947 by 61 enthusiastic users. Provides low cost insurance against lost production and shipping schedule upsets. Builds employee relations and creates customer goodwill.

ACT QUICKLY!—the demand for this new Oil Standby Equipment is rapidly absorbing the available production facilities for installation this fall.

SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

'Surface' INDUSTRIAL BURNERS AND FURNACES

ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL

☐ RUSH 8-page bulletin giving specifications and engineering details.
☐ Glad to have your engineer determine our requirements.

NAME.....

TITLE.....

RETURN THE COUPON ↑ Today!

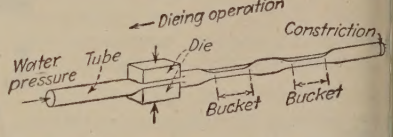
Dear Editor:

GERMAN SUPERCHARGERS

Sir:

The article "Producing Diesel Engine Turbosuperchargers' in yo March 25 issue was of special inte est to me, as I was engaged in de veloping bucket forming technique for the German turbofighter durin the war. Buckets were milled i German factories in nearly th same way illustrated in your articl But the milling of the scoop an back contour of the bucket de manded a great deal of the millin capacity of German armament fa tories, and the Luftwaffenministe ium ordered research to develo new methods not involving millin operations.

In the Research Institute of th Poldi Steel Works (now in Czech slovakia), we made buckets fro tubes of special heat resistant ste The tubes were put under wat pressure and the buckets formed l die application as shown in th figure below. On the free end the tube, a constriction was fixe for pressure regulation. The di ing operation was repeated alon



the length of the tube, and t individual buckets were sawed o ground and welded. The meth was quick and practical, but w never put into production becau of the end of the war and the e pulsion of the specialists engag in the work.

A second method we tried w based on drawing the buckets fr sheets, and a third technique i volved a rolling process similar the known "Pilgerschrittwalzen.'

DR. ING. HANS WUST

Kreis Naila
Bayern-U. S. Zone, Germany

CONTINUOUS CASTING

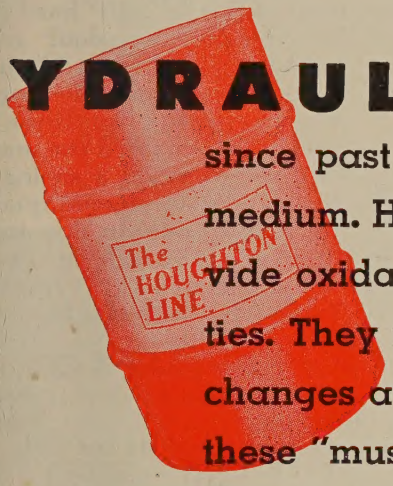
Sir:

Since the presentation of t paper on continuous casting by W. Lippert, your Directing Edit at the annual meeting of t American Institute of Mining Metallurgical Engineers in N York in 1944, I have failed to f any further information on success or failure of this proc

Why not "Ask Houghton" about

PACKINGS ?

A vital part of any hydraulic mechanism is the packing of proper type and design to hold pressures and prevent leakage. It pays to deal with a manufacturer who can provide a complete line of leather packings, as well as synthetic rubber; and who, further, can render expert engineering service on packing installations.

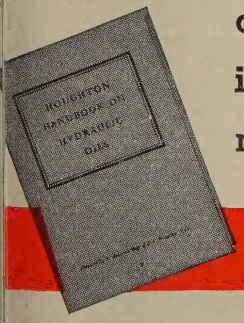


HYDRAULIC OILS ?

The day has long since past when just any oil can be used as the hydraulic medium. Hydraulic oils should be fortified by science to provide oxidation stability, gum solvency, anti-corrosive properties. They must have a high Viscosity Index to resist fluidity changes at varying temperatures. Engineers today recognize these "musts," and specify oils having these qualities.

Houghton supplies, and services, both...

We are the *only* source for both packings and hydraulic oils. We've had half a century of experience in both. We render an unparalleled engineering service on both. We pioneered in additive treatment to fortify oils for this purpose. For those reasons, it will pay you to consult Houghton on hydraulics.



a free copy of the new
ndbook on Hydraulic
s, write E. F. Houghton
o., 303 W. Lehigh Ave.,
la. 33, Pa.

HOUGHTON'S

HYDRO-DRIVE OILS *and*
VIM & VIX-SYN PACKINGS

PAGE
Stainless Steel
WIRE
ROUND
FLAT
OR
SHAPED

"Page for Wire—Especially Stainless"

Remember that the next time you are looking for a responsible source for stainless steel wire. Wire has always been the business of PAGE. And ever since its earliest development, PAGE has been working with stainless.

Whatever problem you may have involving wire—

Get in touch with Page!

ACCO
Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Pittsburgh, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE
In Business for Your Safety

Should you have any knowledge as to whether the process is being accepted or rejected by the industry, I should very much like to know how I may get information on this subject.

W. E. LANDOW
W. E. Landow, Contractor & Builder
Chicago

• **Your inquiry comes at a time when further information on continuous casting is in the process of publication. Our Aug. 19 issue contains an article "Continuous Casting of Semifinished Steel," describing the first successful continuous casting machine to produce steel commercially, and in our Aug. 26 issue an article discusses the Asarco continuous casting process for copper base alloys.—Ed.**

IDENTIFYING METALS

Sir:

Kindly advise us your charge for a copy of the Oct. 17, 1946 issue. We are interested in the article "Quick Methods for Identifying Metals."

G. BREEDING
Hunt & Frandsen Construction Co.
Belle Fourche, S. D.

• **A tearsheet copy of the article has been sent.—Ed.**

STANDARDS DEPARTMENTS

Sir:

We have read with much interest the article in the May 27 issue titled "The Standards Department—Its Organization and Function." May we kindly have a reprint of this article? Can you also advise us of other articles on this subject that have been published in the past year or so.

W. H. BUMPUS
Engineering Department
F. A. Smith Mfg. Co., Inc.
Rochester, N. Y.

• **Tearsheets of the article mentioned and also of two other Iron Age articles on the subject, published in the past year, have been sent.—Ed.**

TOOL STEEL CHARTS

Sir:

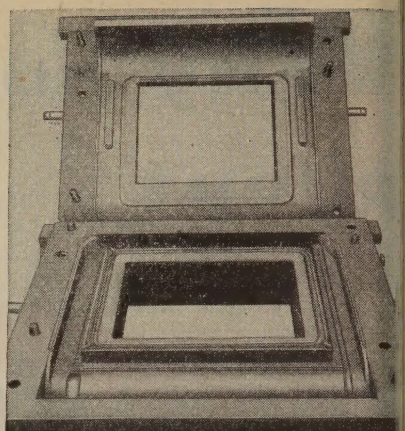
We believe that the "Comparative Tool Steel Brands" charts in the July 29 issue would prove very valuable in our office. Therefore, will you please arrange to have ten copies forwarded to us.

ARNOLD W. NELSON
District Sales Manager
Allegheny Ludlum Steel Corp.
Brackenridge, Pa.

U. N. IRON ORE STUDY

Sir:

We here in the United Nations are making a survey of the iron ore resources of the world and the possibility of expanded supply and better utilization of the lower grades.



40% Saving in Machine Time
with
SPEED CASE® PLATE

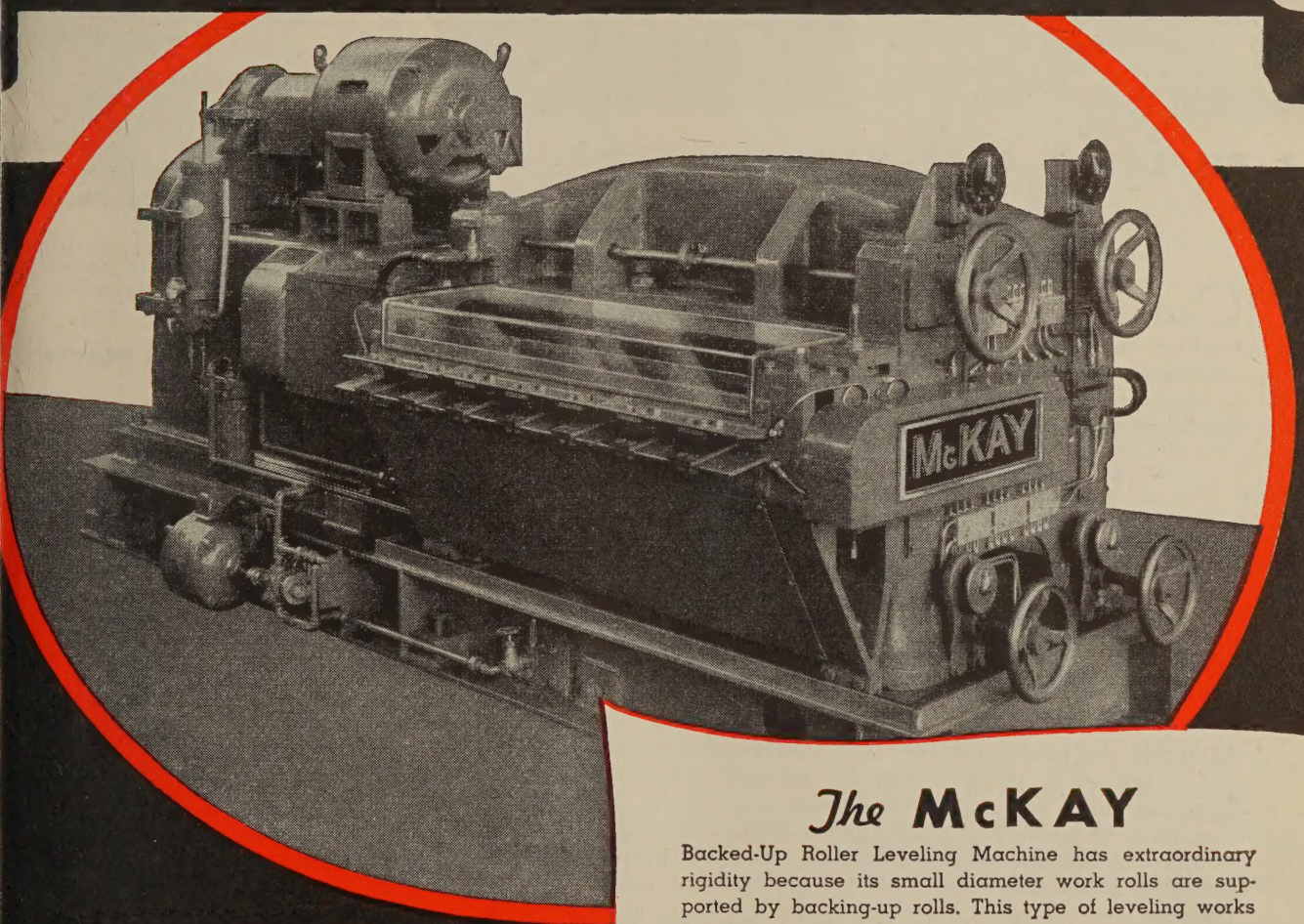
Produced by Luzerne Rubber Company of Trenton, New Jersey, both male and female sections of this 28"x30" hard rubber, refrigerator door molds were machined from 5" thick Speed Case Plate. The superior machining qualities of Speed Case enabled the manufacturer to effect a saving of 40% over commercial quality hot rolled plate. In this application although a large amount of metal was removed, distortion was negligible.

W. J. HOLLIDAY & CO., INC
Speed Case - Speed Treat Plate Division
HAMMOND INDIAN
Plants at Hammond and Indianapo
SPEED CASE — SPEED TREA
WAREHOUSE DISTRIBUTOR
AKRON 1, Ohio
The Burger Iron Company
BOSTON 10, Massachusetts
Brown-Wales Company
BUFFALO 5, New York
Beals, McCarthy and Rogers, Inc.
DETROIT 7, Michigan
Peninsular Steel Co.
HOUSTON 1, Texas
Earle M. Jorgensen Co.
LOS ANGELES 54, California
Earle M. Jorgensen Co.
MEMPHIS 2, Tennessee
Pidgeon-Thomas Iron Company
NEWARK 5, New Jersey
Grammer, Dempsey & Hudson, Inc
OAKLAND 7, California
Earle M. Jorgensen Co.
PHILADELPHIA 34, Pennsylvania
Horace T. Potts Co.
CANADA:
Toronto 2, Ontario, Peckover's, Ltd.

SPEED CASE®
Low Carbon
SPEED TREAT®
Medium Carbon
Open Hearth • Free Machining
STEEL PLATES
W. J. HOLLIDAY & CO.
1850 92 1942
YEARS of STEEL

McKAY

BACKED-UP ROLLER LEVELERS



The McKAY

Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

STANDARD FEATURES

design reduces required
ace.
istments are readily ac-
to the operator.
indicating dials are
for the screw downs.
teel helical gears are
used throughout—all gears fully enclosed and running in oil.
Drive is through improved type McKay universal couplings.
Rugged construction insures continuous performance and low maintenance.

OPTIONAL FEATURES

lubrication system.
rolls for cleaning strip
built-in reservoir and
stem for solvent.
Entry or exit pinch rolls.
Sheet oiling system (on exit side of machine) with integral tank and oil distributing head.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

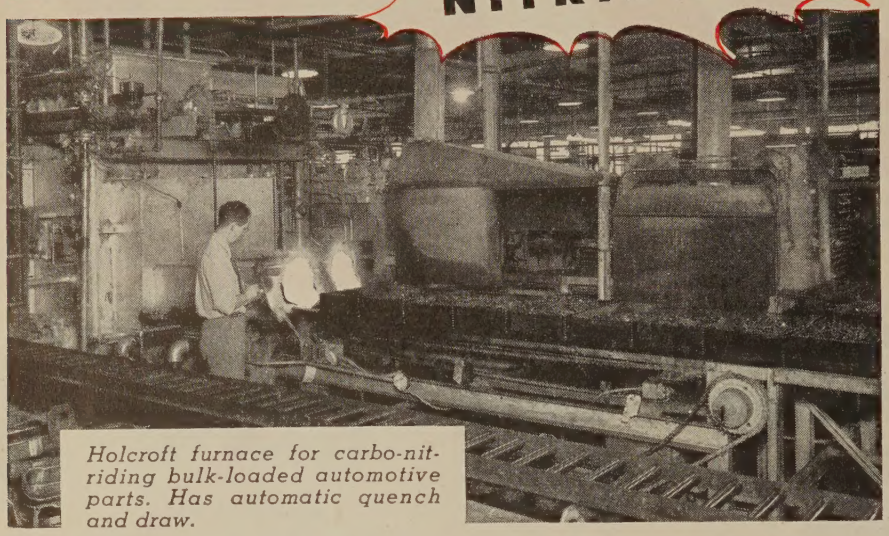
YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

RFORMANCE • RUGGEDNESS • PRECISION AND SAFETY

BLAZING THE HEAT TREAT TRAIL . . .

CARBO-NITRIDING



Holcroft furnace for carbo-nitriding bulk-loaded automotive parts. Has automatic quench and draw.

A SUPERIOR CASE-HARDENING PROCESS

Developed by Holcroft

CARBO-NITRIDING provides a "gas cyanided" case by heating the work in a controlled atmosphere composed of generator gas, hydrocarbon gas and ammonia. This Holcroft process uses continuous-type furnaces such as the unit shown above, and offers these advantages:

1. Low operating cost—often as low as one-fourth that of liquid cyaniding.
2. Superior wear resistance—greater than with carburizing.
3. Greater depth of hardenable case obtained per unit of time than by carburizing at the same temperature.
4. Minimum distortion through low-temperature operation and slow cooling when required.
5. Applicable to both plain carbon and alloy steels.

Although the theory behind carbo-nitriding is mentioned in a patent issued in 1883, it was not applied to high-production furnaces until rediscovered independently by Holcroft & Company in 1936. The first furnaces of this type, built 11 years ago, are still in operation; and many other production furnaces installed since then have further proven the merits of this process.

The Holcroft engineering leadership which developed carbo-nitriding is available to serve you—offering the advanced features and specialized design which assure better results at lower cost in heat treat work of every kind. *We invite your inquiries.*

SINCE 1918 Holcroft AND COMPANY

BUILT BY HOLCROFT & COMPANY DETROIT, MICH.

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

CHICAGO 3
C. H. MARTIN, A. A. ENGELHARDT
1017 PEOPLES GAS BLDG.

CANADA
WALKER METAL PRODUCTS, LTD.
WALKERVILLE, ONTARIO

HOUSTON 1
R. E. McARDLE
5724 NAVIGATION BLVD.

I know that you have a great dea of statistical data on iron ore pro duction and technical informatio on various problems relating to or beneficiation, etc. I should be glac if it is convenient to you, to discus these problems with you.

YEH CHU-PEI
Economic Affairs Offic
United Nations
Lake Success, N. Y.

• "Iron Ore Reserves of the World," Ol Report No. 4260, published by the Dept. c State, Washington, contains the best accum lated data on this subject.—Ed.

STEEL CONVERSION

Sir:

Your July 29 issue had an articl entitled "A Primer on Steel Conver sion." If reprints are available please send us several.

M. E. GRAFF
Rich Steel Co.
Los Angeles

ALUMINUM BONDING

Sir:

We are interested in obtainin a copy of the article in your July issue entitled "Bonding Aluminur to Ferrous Metals."

PENNY MEEKS
Librarian, Tech. Service Dep
Reynolds Metals Co., Aluminum Div.
Louisville

GERMAN ALUMINUM PRACTICE

Sir:

We would appreciate your aid i obtaining the British report men tioned in your article "Germa Aluminum Practice" in the July issue.

E. H. KINELSKI
Metallurgi
Cornell Aeronautical Laboratory, Inc.
Buffalo

• The report is entitled "Welding of Alum num and Aluminum Alloys with Particul Reference to the Manufacture of Pressu Vessels" and is designated PB-34016. Copi are available at $1.00 each from the Offi of Technical Services, Dept. of Commerc Washington. Orders should be accompanie by check or money order payable to th Treasurer of the U. S.—Ed.

AUTOMATIC WELDING

Sir:

We would like an additional cop of the article "Automatic Weldin of Steel Mill Equipment" which ap peared in the July 15 issue.

NORMA WOODCOCK
Librari
U. S. Steel Corp. Subsidiaries
Pittsburgh

CENTRIFUGAL CASTING

Sir:

We would appreciate it very muc if you could send us a tearsheet the article "Centrifugal Casting Germany" which appeared in th

MONEY, certified as to weight and fineness by our Federal Government, and Kennametal Tools, made by Kennametal Inc.—a private concern at Latrobe, Pa.—are both tools of present and potential value to a free America.

How is sound money a necessary tool for free people? It facilitates honest exchange of goods and services between persons. Thus it is used as a measuring tool. How well it serves its purpose depends upon the degree of certainty which persons may place upon its present and future value.

Kennametal Tool Blanks and Kennametal Tools merit confidence as to their value. They facilitate daily production in metal-working shops, in mines, and in construction work, enabling the workers to do their work effectively, thus helping maintain high standards of living in times of peace and providing weapons for our defense in times of war. Durability, hardness, and utility are embodied in Kennametal products.

Money will serve its necessary purposes, inspiring thrift, lending for worth-while enterprise, and protecting the real value of savings accounts, life insurance, and customary forms of saving, only when uncertainty is removed by stabilizing our currency, as proposed in a bill now pending before Congress*. A deteriorating, non-redeemable money robs all who earn and save.

There is no uncertainty about Kennametal. It is not a mere fiat certificate of value; it has intrinsic worth—lasting merit—as valuable 10 years hence as now—one piece equally as good as another.

This uniformly excellent tool material is obtainable "on demand" at our plant at Latrobe, Pa., or any of our branches in industrial centers of the United States. It is truly the "All American Carbide". From our new Catalog 48 you can order the tool tips and complete tools you need, with assurance that full value will always be realized.

Gold is the Tool that Shapes World Security

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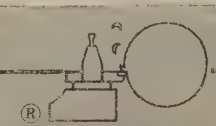
One half so precious as the Goods they sell."
Rubaiyat of Omar Khayyam

* **BILL H. R. 5031** introduced into the House of Representatives, January 20, 1948, by Congressman Buffet of Nebraska cited as the "Gold Standard Act of 1948."

A BILL

"To restore the right of American citizens to freely own gold and gold coins; to return control over the public purse to the people; to restrain further deterioration of our currency; to enable holders of paper money to redeem it in gold coin on demand; to establish and maintain a domestic gold coin standard; and for other purposes."



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LEBANON *ALLOY AND STEEL* Castings Ⓛ

July 25, 1946 issue. Also we would like to obtain copies of the articles listed in the selected bibliography at the end of the article "A Critical Survey of Investment Casting" in the May 13 issue.

JACK O. FELT
Earle Ferris Co.
New York

• **Tearsheets of the article on German centrifugal casting practice have been mailed. Many of the other articles, mentioned in the bibliography, have been reprinted in a booklet entitled "Precision Investment Casting" which is available at $1.00 per copy.—Ed.**

REHEATING ALUMINUM SHEET

Sir:

We would appreciate receiving two reprints or tear sheets of the article "Reheating of 24S and 75S Aluminum Sheet," appearing in the Dec. 25, 1947 issue.

R. H. HOPP
Technical Librarian
Battelle Memorial Institute
Columbus, Ohio

EMPHASIS ON DEFENSE

Sir:

Please send me three copies of the editorial "Emphasis on Defense" in the Mar. 11 issue.

N. M. GRON
Purchasing Dept.
Howe Scale Co.
Rutland, Vt.

TRADE NAMES

Sir:

I would like to obtain one copy of the book entitled "10,000 Trade Names."

R. R. HERSHEY
Steel & Tube Div.
Timken Roller Bearing Co.
Milwaukee

• **The directory is available to subscribers at $3.00 each for one or two copies; $2.50 each for three to nine copies; $2.00 each for 10 or more copies.—Ed.**

PRODUCTION CONTROL

Sir:

We would appreciate your mailing us a copy of "Putting Production Control to Work" as it appeared in your May 16, 1946 issue.

L. C. SPARKS, JR.
Indiana Gear Works
Indianapolis

• **Tearsheets have been mailed.—Ed.**

WIRE FATIGUE TESTING

Sir:

I would appreciate receiving additional information on the second Newsfront item in the July 2

WANTED: A quick-drying, oil-resistant finish to apply to bearing housing castings before machining.

Advance meets Link-Belt's needs

For more than 15 years, the Advance Paint Company has been solving the finishing problems posed by the varied products manufactured by the Link-Belt Company at its two Indianapolis plants.

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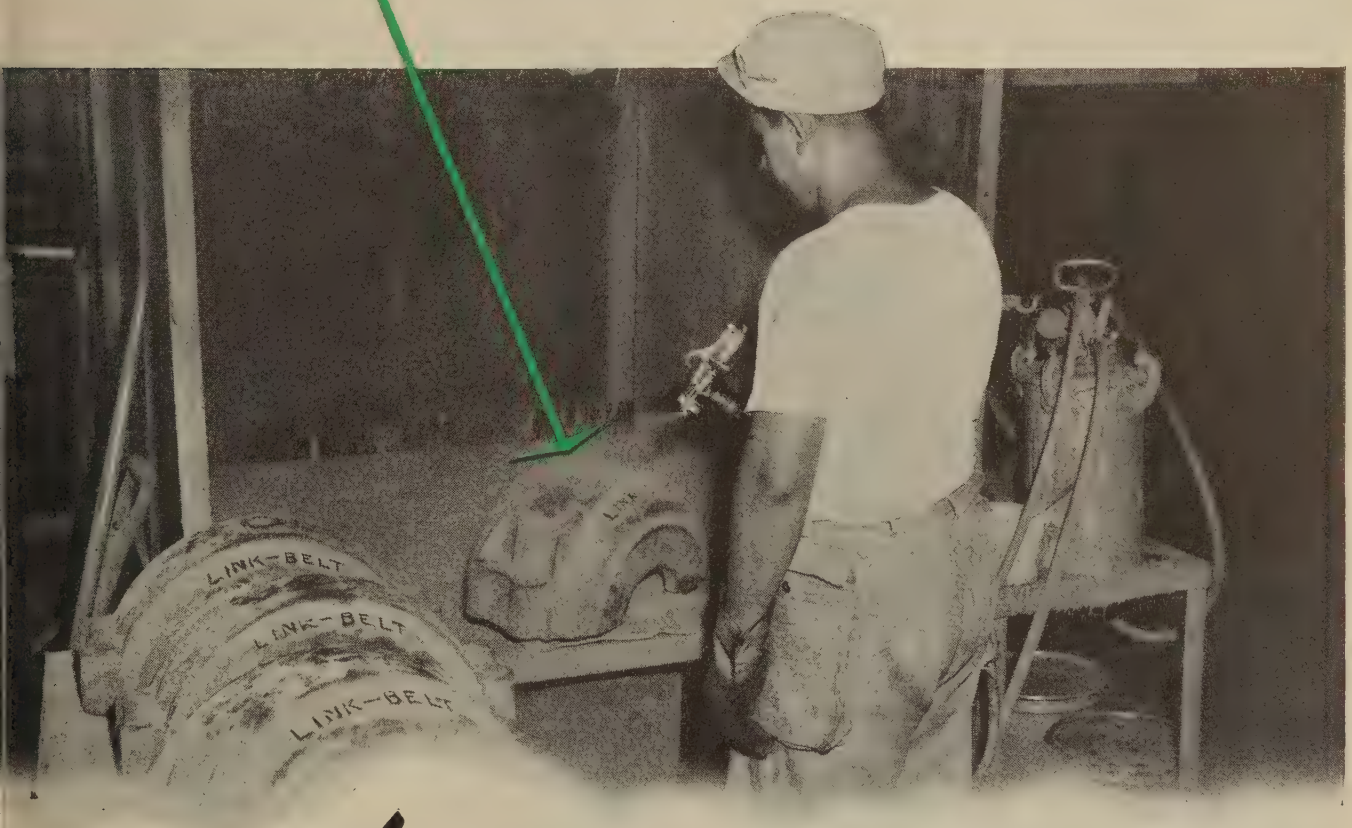

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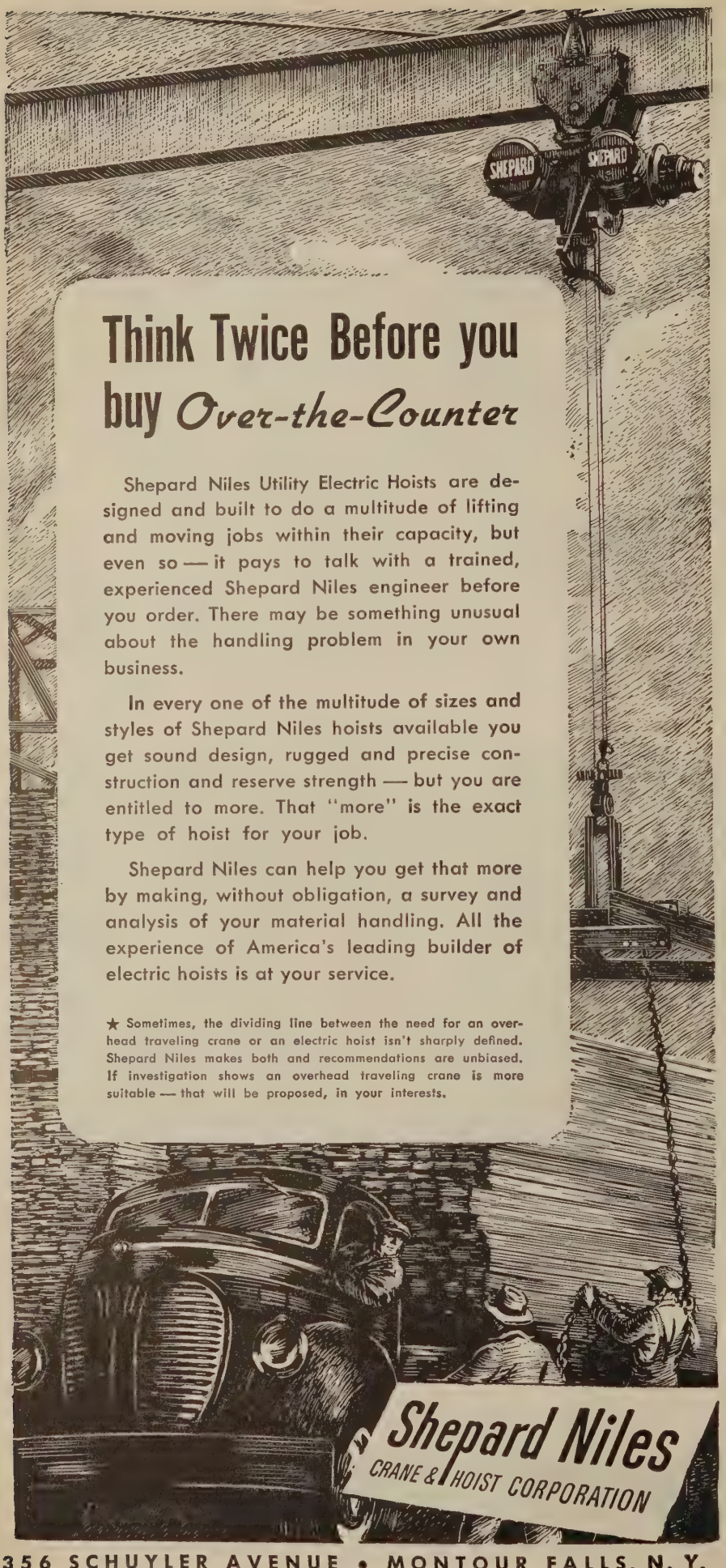
Advance PAINT COMPANY
INDIANAPOLIS, INDIANA



issue dealing with a test for obtain ing fatigue strength endurand limit values for wire.

J. S. WORTH
Asst. Metallurgical Engine
Bethlehem Steel Co., Inc.
Bethlehem

• **The article "New Wire Fatigue Testi Method" in the Aug. 12 issue gives furth details.—Ed.**

PRODUCTION CONTROL

Sir:

Will you kindly send tear shee on "Production Control in a Hig Alloy Steel Plant."

D. A. FRIEDMAN
Hanover Steel Corp.
New York

• **Tear sheets of the article which appe in the June 3 issue, have gone forward. Ed.**

Sir:

It is requested that this office h forwarded a reprint of article title "Critical Survey of Investmer Casting" published in the May 13 i sue. This article is to be used f information purposes only.

J. F. GAMBER
Colonel, Ordnance Dep
War Dept.
Washington

ALL-STAINLESS CAR

Sir:

In Newsfront in the April 27 issu an item stated that one of the rai roads is planning a dining c which would be stainless steel fro "sink to cutlery." Please advise t name of the railroad.

H. T. S. HECKMAN
Advertising Divisi
Republic Steel Corp.
Cleveland

• **The car is Robert R. Young's private di on the Chesapeake & Ohio Railroad.—Ed.**

CERMETS

Sir:

Newsfront in the May 13 iss has an item on increasing t breaking strength of cermets thermal shock. We would like obtain more information about th

CHARLES F. DeVO
Development & Research De
Corning Glass Works
Corning, N. Y.

• **Ceramic Department of the U. of Illin Urbana, Ill., will give you further deta —Ed.**

STRETCH FORMING

Sir:

Please send me a copy of the a ticle "Stretch Forming Aluminu Sheets" from the June 3 issue.

B. KARNISK
Test Engineer, Welding
Eng'ing De
Pullman-Standard Car Mfg. Co.,
Pullman Car Works
Chicago

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Steel Hard to Get?

Demand Still Exceeds Supply But . . .

. . . this is a typical view of night loading operations at a Ryerson steel-service plant. The steels specified on several orders are on their way to a loading platform for delivery the following morning. Possibly none of these orders are completely filled—however, the fact remains, we are doing our very best to serve a large group of steel users.

Unfortunately, it often seems that the particular steel *you* want is never on hand, and it is true that we are always short of some kinds and sizes. But our stocks turn over fast. A size that is out today may be in tomorrow. And in spite of current conditions, we still believe the over-all stocks at our thirteen plants are the nation's largest.

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The IRON AGE

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SEPTEMBER 2, 1948

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Shadow Boxing

OUT of the simple and complex worries of the American people the political stalwarts of the major parties have fashioned two major issues, the high cost of living and the infiltration of government service by treasonable elements. The still greater problem of possible war with Russia, has fortunately enlisted the cooperation of both parties.

The public can expect a full scale discussion of inflation and communist influence in government. During the sound and fury of the campaign it may appear to the voter that no punches have been pulled, that the contest is a deadly serious effort to win his confidence, that the strong white light which beats upon personalities and issues will fully probe all angles and reveal the sins of omission and commission on both sides.

This is a rather ideal portrait of a political contest in these United States. It is true that the candidates on both sides are struggling for power and even survival as politicians. However, careful observation of the apparently uninhibited slugging shows a mutual regard for sensitive spots. This is due not to any magnanimous sense of sportsmanship or chivalrous restraint but rather to the common vulnerability of both parties.

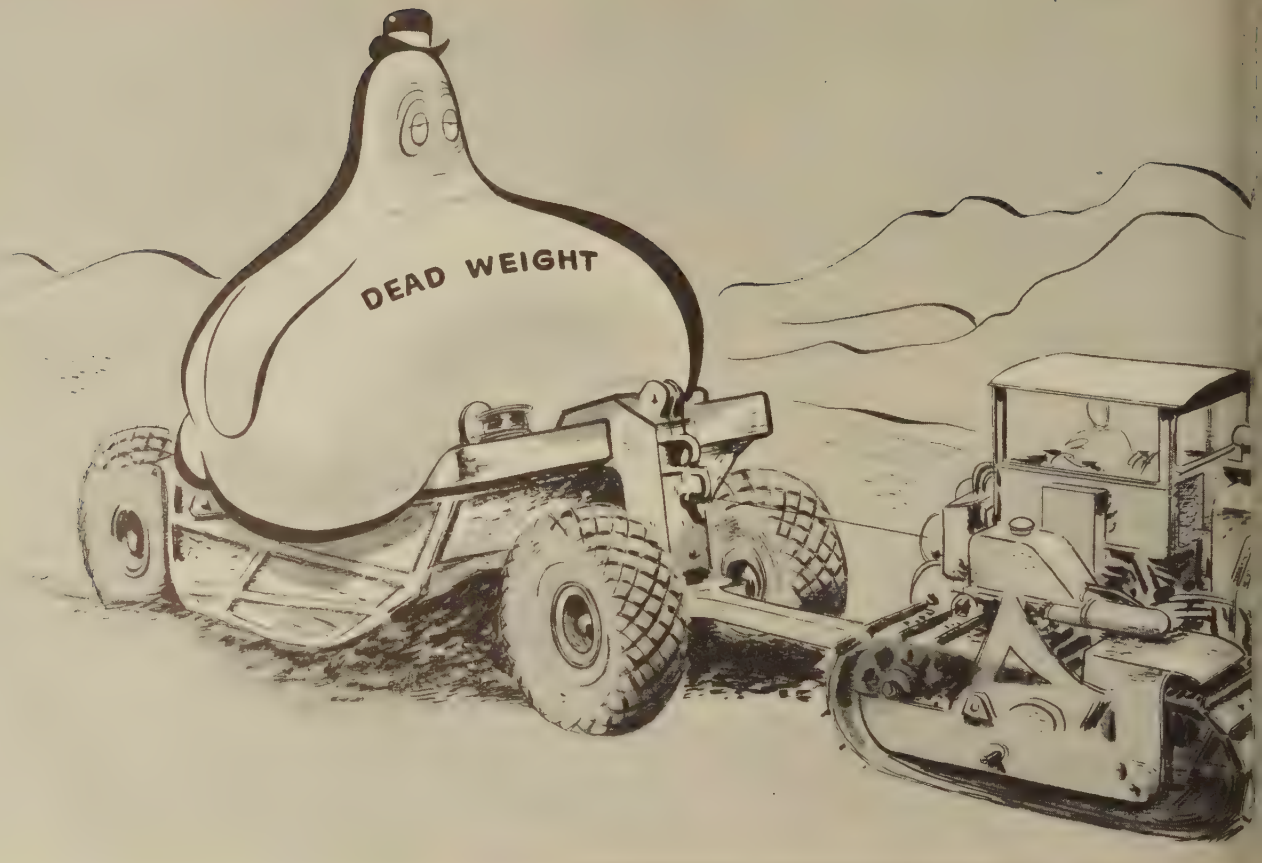
One can be reasonably certain that the charge and countercharge which attempts to fasten upon the other party the blame for the high cost of living will tread carefully between the valid and the false causes of high prices. An honest identification of inflation origins would be politically imprudent for both parties. It would call attention to special and substantial favors granted to powerful voter groups, the farmers through a protected price structure, the veterans through extravagant credit privileges, labor through numerous industry wide monopolies. The political argument will deal with the shadow while meticulously ignoring the substance of the price problem.

That the government has harbored communists is no news to anyone who has observed this government in action during the past fifteen years. While paying lip service to free enterprise it has done almost everything which a cunning revolutionary ideology could suggest to insure the ultimate failure of such enterprise. A vital phase of this destructive strategy has been the multiplication of government functions and the enormous increase in personnel which this entails.

On the eve of war in 1940 total employment in federal, state and local government amounted to 4,100,000 or 7.1 pct of the nation's labor force. Eight years later the public service - this excludes the military - accounted for 6,400,000 jobs or 10.3 pct of our labor force. It may be interesting to note that in the spring of 1948 only 7,400,000 workers were engaged on all the farms in the country.

Here and there lone voices such as Byrd, the Democrat, and Wherry, the Republican, call attention to this parasitic peril. However, when a single eastern state places at the disposal of the party a round total of 300,000 appointive jobs which may be distributed among worthy workers we can hardly expect the politicians to regard this malevolent tumor as an unmixed evil. About this aspect of the personnel issue the blows of the boys in the political ring will contact nothing but air.

Joseph Stagg Lawrence



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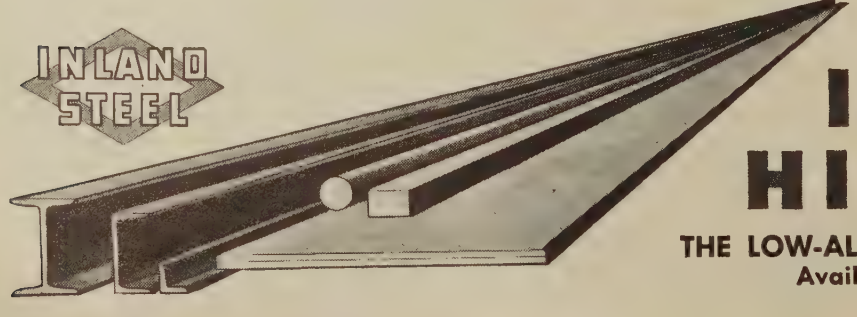
On-the-job experience proves that mobile equipment made of Inland Hi-Steel is a sure cure for those unnecessarily high operating costs caused by dead weight.

It's Hi-Steel's high strength-to-weight ratio that makes the difference. This remarkable low-alloy steel has nearly double the working strength of ordinary structural steel, with more than 50% greater ability to stand up under dynamic loads. This means that mobile units built with Hi-Steel, freight cars, trucks, or earthmovers, can carry substantially greater loads with no sacrifice in structural strength.

You get other advantages with Hi-Steel, too. It has about five times the atmospheric corrosion resistance of ordinary steel and is far more resistant to abrasion. It can be worked hot or cold, with little or no change from standard shop practice.

To make larger tonnages available to you, other companies are licensed to make Hi-Steel. Write for Bulletin No. 11. INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, and St. Paul.

Hi-Steel meets the requirements of SAE Specification 950



INLAND HI-STEEL

THE LOW-ALLOY, HI-STRENGTH STEEL
Available in Many Forms

► Some small firms are studying the idea of having warehouses distant from the mill where some fabricating of steel will be done. This could mean that the price of the material would be f.o.b. the fabricating shop. It would also allow the steel firm to absorb some of the freight to such a warehouse in order to meet competition. The trend is not yet strong -- but just being explored."

► Probably the largest order for sintered tungsten carbide since V-J Day has been placed by a commercial stoker manufacturer. The order was for one ton -- a large quantity when compared with the usual gram and pound business. It will be used to face coal pulverizing parts in furnace stokers. Another firm is experimenting with the same material by tipping drill and cutter bits used in coal mining.

► An X-ray fluorescence analysis method has been devised for analyzing quantitatively metallic and nonmetallic materials. It permits the analysis of finished or semifinished products without destroying or changing the samples in any manner. Raw materials can be analyzed without loss for sampling. Particularly suited to the analysis of high alloy steels and high temperature heat and corrosion resistant alloys, this method bypasses the ramifications associated with photographic technique.

► America's vehicle population is building up rapidly despite all the stories about throttled automotive production. By the end of this year over 40 million vehicles will be crowding the highways. This is an increase of 17 pct over 1941. Most of the 40 million, it is expected, will be on the road by Labor Day weekend.

► Electronic controls have been effective in stepping up production rates of die sinking and contour forming equipment. But it is felt that they will not be applied generally to the machine tool industry in the near future because of their high original cost and buyers' fears that they will not be able to have them serviced quickly. However, certain types of machine tools are now available with electronic controls if desired.

► A continuous strip mill for the production of stainless steel strip up to 50 in. wide is now in operation at Massilon, Ohio. Although it is not yet at full production, officials expect that its monthly capacity will reach 4000 tons. Before the war, requirements for stainless steel could not provide an adequate return for investment in continuous mills. But it is expected that the steadily rising demand for stainless steel will warrant similar investments by other producers. Stainless strip from this mill is reported to come out with a bright finish that requires no polishing for many applications.

► Three German technicians are working on an Air Force turbine project in a Detroit plant. Their particular specialty is the making of tools and dies for the production of hollow turbine blades from high quality steels. Another German technician employed in a midwest factory specializes in magnetic materials in the form of permanent magnets of high intensity, and powder metallurgy. They all did similar work in Germany.

► Detroit sources now believe Plymouth will lead the new model parade for Chrysler and Buick will be the first of the remaining GM lines to show new postwar models. Most of these cars are expected to make their debut late in December or early in January.

► Scrap dealers continue to depend largely on industrial plants for much of their scrap supply. Some sources believe that big consumers of steel scrap hope to have large tonnages from foreign markets before the end of fall. Something has to be done if it is hoped to maintain normal operations during the winter.

► A satisfactory process for brazing magnesium has recently been developed by a midwestern firm. A flux is necessary to keep surfaces free from oxide and other films in order to permit capillary flow during brazing. Galvanic corrosion is largely eliminated because both the brazing alloy and the part to be welded have magnesium as their base. Advantages claimed for the process are smooth joints that require little or no dressing and that parts too thin for welding can be brazed.

Metallurgical Aspects of Ball Bearing Steels

Exploring the metallurgical requirements of alloy bearing steels, from the producer's point of view, the author presents herein results of a comprehensive study embracing some new alloy combinations as well as the accepted chromium grades. Chemical analysis and its influence on hardenability; nonmetallic inclusions and carbide segregation and their effects on bearing life, are among the concepts discussed in this first part of a three-part article. Among the new analyses proposed is an alloy wherein molybdenum is substituted for chromium.

By A. S. JAMESON

Asst. Manager of Metallurgical Div.,
Manufacturing & Research Dept.
International Harvester Co.,
Chicago

THEORETICALLY, ball bearings in operating mechanisms are subjected only to rolling wear. Actually, they are exposed to rubbing wear due to deviations from theoretical dimensions and improper adjustment in operational assembly, and to chemical wear due to contact with the atmosphere or lubricants containimpurities. Material used for bearings must have a high elastic limit so that it will not deform plastically under load, and a high fatigue resistance to contend with alternating compressive and tensional stresses of a high order.

Choice of material is, therefore, a very important consideration in the making of ball bearings. In selecting a material, economic factors must naturally be considered, which means that the material cost must be as low as is compatible with physical requirements. Though ball bearing balls and race rings are made from low carbon steel, carburized or cyanided to produce a hard surface, by far the most popular materials are the through-hardening steels. The author will confine this article to a discussion of materials for outer and inner rings and only those materials of the through-hardening type. The heat treatment of the materials is not covered in detail.

Table I gives the steel analyses used for rings. The first three analyses are standard AISI steels, while the other analyses are used by SKF Industries, a manufacturer of ball bearings. SKF 3 is similar to AISI E-52100 and SKF 9 is similar to AISI E-50100. SKF 1 and 2 are used for the largest ring sizes. A survey of other leading manufacturers indicates that AISI E-52100 is the most widely used material for rings. During World War II, due to the unavailability of chromium in large enough quantities to support the demand for alloy steels containing larger proportions of this metal, consideration was given to alloy steels with lower chromium content and higher manganese content and to the substitution

of molybdenum for chromium. Molybdenum is available in large quantities within the borders of the United States.

Table II gives the analyses of some of the steels studied. The investigation of the first four analyses in table II was sponsored in 1941 by the WPB Technical Advisory Committee in cooperation with the Roller Bearing Engineers Committee. These steels were made in heat lots by four steel producers, and were submitted in tube and bar form to several ball bearing manufacturers for experimental manufacture and testing. The fifth analysis was instituted independently in 1941, whereby molybdenum additions were made to an ingot, poured from a carbon steel heat, in sufficient quantity for the manufacture and testing of inner race rings. The sixth analysis is a steel used currently for machine shop applications.

In general, the engineering requisites for a steel for ball bearing race rings are (1) maximum resistance to rolling wear and (2) a high elasticity. Metallurgically, this means the selection of a steel with a carbon content in excess of 0.85 pct and preferably, though not necessarily, the addition of some carbide-forming alloy to increase the hardness. Approached from this point of view a plain carbon steel containing 0.95 to 1.10 pct C would fulfill the minimum requirements.

A typical alloy bearing steel structure is illustrated in fig. 1. This microstructure consists of carbide spheroids in a matrix of martensite, with an overall hardness of 63 Rc. The carbide particles have a wide range of size in this particular microstructure, the largest representing the maximum desirable size. The statement regarding engineering requisites was somewhat oversimplified, for there are a number of other considerations involved in the selection of a race ring steel. The two most important ones are concerned with the heat treatment necessary to attain the desired hardness of 61 to 63 Rc and are: (1) the hardenability of the steel, and (2) the nondeforming characteristics of the analysis. The attainment of maximum nondeforming characteristics would rule out the use of a plain carbon steel, since the heat treatment of the plain carbon steel, except very small sections (less than ¼ in.) would require water quenching. Water quenching would result in excessive distortion.

A survey of table I will show that all the listed steels have carbon contents in excess of 0.85 pct and all are capable of being oil hardened in reasonable section.* The first two steels in table I, AISI E-50100 and 51100, are not, to the author's knowledge, used in the manufacture of race rings to any great extent, but are used for ball bearing balls. They could have application to race rings of smaller sizes. Their calculated hardenability curves are shown and compared with 52100 in fig. 2. Calculations from fig. 2 would indicate that they should harden throughout on oil quenching in sections as shown in table III.

Hardenability curves for the steels listed in table II are shown in fig. 3. Calculations from fig. 3 would indicate that these steels should harden to 60 Rc on mildly agitated oil quenching

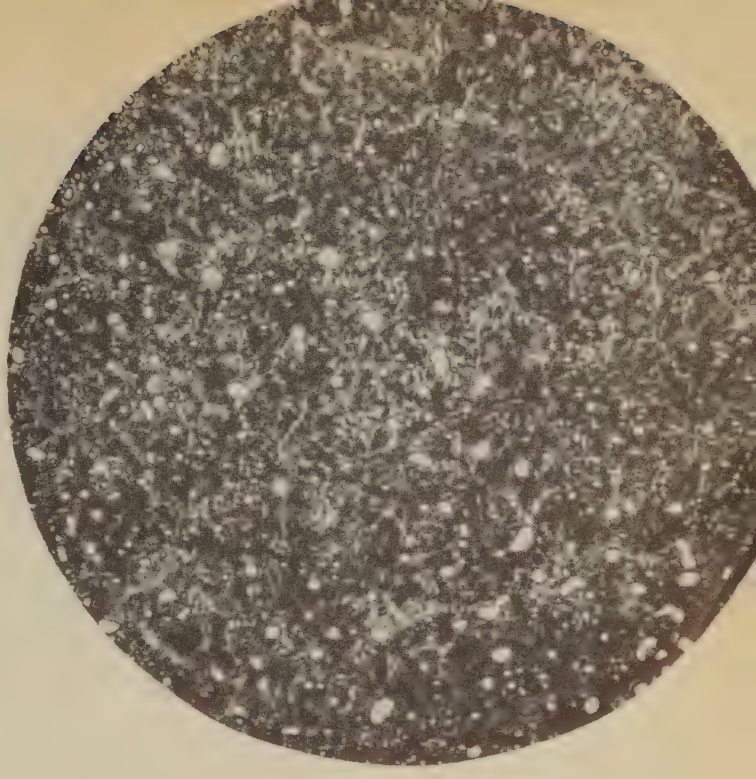


FIG. 1 - Photomicrographs of AISI E-52100 steel race ring hardened from 1550°F in oil and tempered at 325°F. Hardness 63 RC; fractured grain size No. 8.5; etched 2 pct Nital. 1000X.

** Calculated hardenability curves for SKF steels 1 and 2, using the nominal analysis as shown in table I, projected on an ASTM hardenability chart, show that these steels would harden to at least 60 Rc along the end-quench test bar to a distance in excess of 32 sixteenths. This would indicate an ability to oil harden in large sections. The use of these steels is confined to very large bearing rings not ordinarily used in mass production automotive applications. SKF steels 3 and 9 being similar in composition to 52100 and 50100 would have the same hardenability characteristics.*

TABLE I

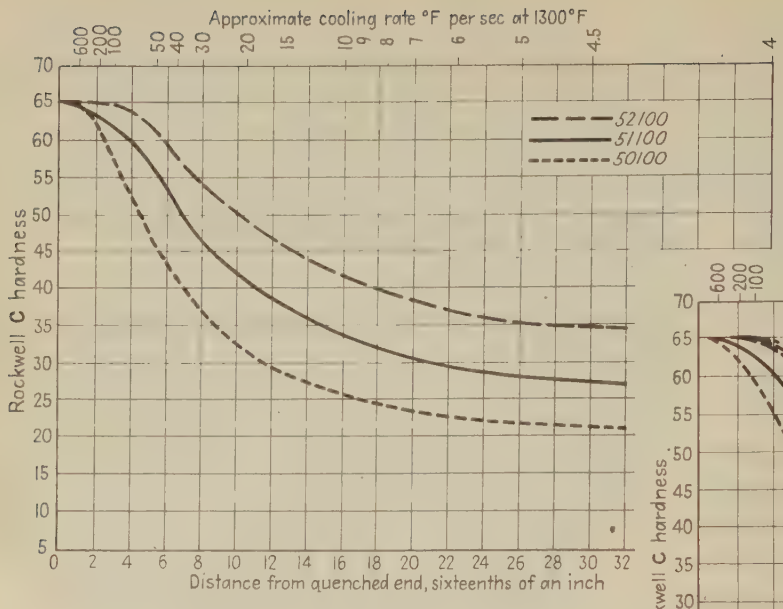
Nominal Composition of Ball Bearing Race Ring Steels

Designation	Composition, Pct Carbon	Manganese	Silicon	Chromium
AISI E-50100	1.05	0.35	0.25	0.50
AISI E-51100	1.05	0.35	0.25	1.05
AISI E-52100	1.05	0.35	0.25	1.50
SKF-1	0.95	1.15	0.60	1.05
SKF-2	0.92	1.55	0.70	1.55
SKF-3	1.00	0.35	0.25	1.45
SKF-9	1.05	0.35	0.30	0.50

TABLE II

Nominal Composition of Special Ball Bearing Race Ring Steels

Designation	Composition, Pct Carbon	Manganese	Silicon	Chromium	Molybdenum
"A" Cr-Mn	0.95	1.15	0.30	0.40	.....
"B" Cr-Mo	1.00	0.70	0.30	0.50	0.20
"C" Cr	1.00	0.80	0.30	0.80	.....
"K" Mo	1.00	0.75	0.35	.....	0.25
0.5 pct Mo	1.00	0.30	0.25	.....	0.50
Mn-Mo	0.90	1.55	0.25	.....	0.25



ABOVE

FIG. 2 - Calculated hardenability curves for AISI E-50100, 51100, and 52100.

BELOW

FIG. 3 - Calculated hardenability curves for steels in tables II and VI.

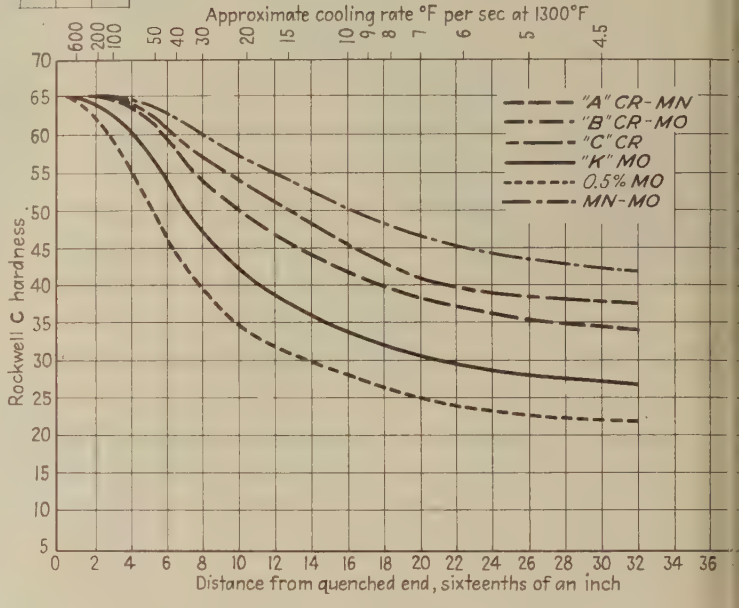


FIG. 4 - Internal burst in E-52100 race ring made from seamless steel tubing.

in sections as shown in table IV. The curves were calculated employing the Stephenson-Pfahl calculator, using the carbon content fixed at 0.9 pct; the hardenable section calculations are taken from the SAE 1947 handbook.

The foregoing information on the hardenability of the steels listed in tables I and II is given because hardenability is an important consideration in the selection of a steel for a particular bearing race size. Utilizing the hardenability concept furnishes one with a tool to achieve a desired hardness pattern, inasmuch as a steel with an inability to harden properly contributes to excessive distortion in the processed part.

It might be assumed that the selection of a steel analysis for race rings can be done theo-

FIG. 5 - Pitting of raceway of race ring due to nonmetallic inclusions. (A) unetched: (B) etched in 1:1 HCl.

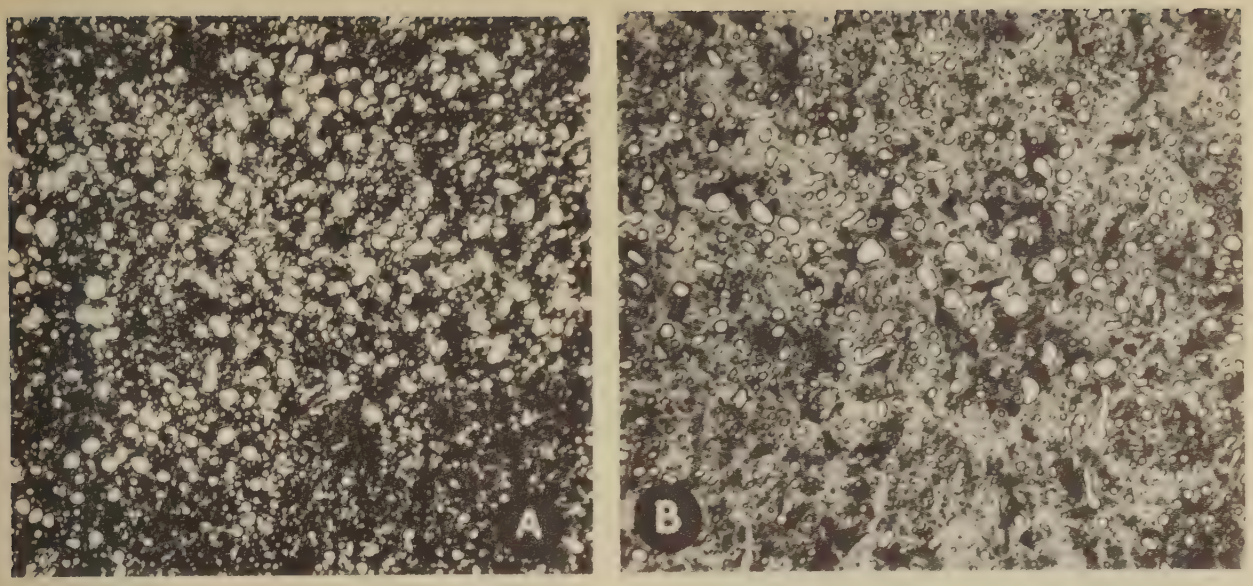


FIG. 6 - Photomicrographs of carbide segregation, 1000X; etched 2 pct Nital. (A) heavy carbide concentration, (B) light carbide concentration.

retically by hardenability calculations and that the design and manufacturing engineer could be convinced by the metallurgist of the suitability of a given analysis purely on this basis. However, this is not the case; the engineer could rightly demand actual supporting tests on the material before accepting the metallurgist's recommendation. The attitude is justifiable, since there are some considerations which somewhat upset the theoretical calculations. Some instances will be referred to later in the article.

The usual procedure, then, is to submit the proposed analysis to (1) quality tests which are ordinarily imposed on the currently used material, and (2) tests to determine characteristics which may have a bearing on manufacturing operations (especially the heat treating operation), and on the final mechanical properties of the part. Should the quality tests yield information that would warrant the final trial, that of processing the material into finished parts, the investigation would continue by the observation and recording of data on: (1) forging, (2) annealing, (3) machining, (4) heat treatment, (5) grinding, and (6) accelerated life tests.

The customary quality tests which would be applicable to bearing steel are: (1) chemical analysis with special reference to incidental elements and undesirable impurities such as sulfur and phosphorus, (2) macrostructural appearance after deep etching, (3) nonmetallic inclusion count, (4) microstructural examination, and (5) hardness determination where the material is purchased in the annealed condition.

These tests and one not listed above, the fracture test, are covered in ASTM Tentative Standard, A295-46T.[1]

The tests made to determine characteristics would depend largely on the judgment of the metallurgist conducting the investigation. These may consist of: (1) hardenability tests through a range of hardening temperatures, and (2) fractured grain size determinations after hardening through a range of temperatures and employing several holding times before quenching, and (3) possibly the inclusion of supplementary impact test data.

Data obtained from observation of the processing through manufacturing operations would consist of hardness and microstructural tests after annealing, comparison of feeds and speeds and surface finish in machining operations, hardness and fractured grain size and size changes after heat treatment, and Magnaflux tests during and after grinding. The accelerated life test would be conducted on at least 20 bearings, with the data gathered on the basis of overloading to the extent of three times the normal load rating.

The author proposes, as a mode of presenting data available on the steels listed in table II, to follow through the complete testing procedure,

TABLE III

Comparison of Hardenability in Round Sections

Symbol Steel	Rating J-60	Maxium Section which Hardens Throughout to 60 Rc in Mildly Agitated Oil, In.
AISI E-50100	2.0	0.2
AISI E-51100	4.0	0.6
AISI E-52100	6.0	1.0

TABLE IV

Comparison of Hardenability in Round Sections

Steel	J-60 Rating	Maxium Section which Hardens Throughout to 60 Rc in Mildly Agitated Oil, In.
"A" Cr-Mn	5.5	0.9
"B" Cr-Mo	8.0	1.4
"C" Cr	6.0	1.0
"K" Mo	4.0	0.6
0.5 pct Mo	2.5	0.3
Mn-Mo	8.0	1.4

TABLE V

Actual Chemical Composition of Test Materials (See Table II)

Designation	Composition, Pct C	Mn	S	P	Si	Cr	Mo	Ni
"A" Cr-Mn	0.96	1.06	0.018	0.011	0.31	0.37	0.04	.....
"B" Cr-Mo	1.00	0.69	0.018	0.012	0.31	0.56	0.21	0.14*
"C" Cr	0.99	0.71	0.018	0.012	0.23	0.78	0.05*	0.23
"K" Mo	0.93	0.74	0.015	0.015	0.26	0.24*	0.25	0.13*
0.5 pct Mo	0.94	0.35	0.014	0.019	0.22	0.08*	0.48	0.05*
Mn-Mo	0.90	1.55	0.020	0.018	0.25	0.16*	0.23	.....

* Incidental

using AISI E-52100 steel as a basis of discussion and comparison.

Chemical analysis from a quality standpoint would imply compliance with a specified check analysis range. The AISI Manual,[2] section 10, covers hot rolled alloy steels and shows standard ranges for elements which would apply to AISI E-52100 as follows (assuming basic electric furnace practice):

Element	Standard range pct based on max of specified range, pct	Lowest max to be specified, pct
C	0.15	.....
Mn	0.20	.....
P	.....	0.025
S	.....	0.025
Si	0.15	
Cr	0.35	.....

These ranges are subject to permissible variations from the specified chemical ranges and limits as follows:

Element	Element Standard variation pct over max limit or under min limit (size range 100 sq in. or less)
C	0.03
Mn	0.03
P (over max only)	0.005
S (over max only)	0.005
Si	0.02
Cr	0.05

Strictly speaking, the standard ranges do not apply to a standard steel such as E-52100. The ranges for E-52100 are set up as follows:

Element	Range, pct Min	Max
C	0.95	1.10
Mn	0.25	0.45
P	.....	0.025
S	.....	0.025
Si	0.20	0.35
Cr	1.30	1.60

The standard ranges for a nonstandard steel are actually applied to all the elements of E-52100 except chromium, which is restricted to 0.30 instead of 0.35.

The standard variations for check analysis do apply to E-52100 so that where E-52100 is analyzed, the actual check analysis ranges are:

Element	Range, pct Min	Max
C	0.92	1.13
Mn	0.22	0.48
P	.....	0.03
S	.....	0.03
Si	0.18	0.37
Cr	1.25	1.65

However, any element cannot vary both under and over the specified range in any one heat. There is a further consideration with respect to chemical analysis in that the presence of residual elements is controlled as follows) according to Supplementary Information, Manufacturers Standard Practice[3]: "Small quantities of certain elements may be found in alloy and electric furnace carbon steel which are not specified or required. These elements are to be considered as incidental and acceptable to the following maximum limits: Cu—0.35 pct; Ni—0.25 pct; Cr—0.20 pct, and Mo—0.06 pct." E-52100 specifications would therefore show three further elements; 0.35 pct max Cu, 0.25 pct max Ni, and 0.06 pct max Mo.

Where hardenability is a consideration in the use of E-52100, the standard variations for check analysis and the presence of incidental elements must be taken into account. If E-52100 was purchased according to a hardenability specification, which to the author's knowledge is not done, the standard variation and incidental alloy would not be important (this will be discussed later).

In practice, ball bearing manufacturers have tended to consider their steel as a special case and have set up specifications which tend to restrict the variations in chemical composition. Emphasis on the variations in manganese, silicon and the presence of incidental elements is questionable unless hardenability is considered as being an important requirement. The presence of phosphorus and sulfur is looked on as being undesirable and it is stated by some observers that those elements should be as low as possible in bearing race ring steel.

The actual chemical composition of the steels

TABLE VI

Proposed Chemical Composition Ranges for Test Materials (See Table II)

Designation	Composition, Pct C Min.	C Max.	Mn Min.	Mn Max.	Cr Min.	Cr Max.	Mo Min.	Mo Max.	Ni Min.	Ni Max.	Cu Min.	Cu Max.
"A" Cr-Mn	0.95	1.10	0.90	1.20	0.30	0.50	.....	0.06*	.....	0.25*	.....	0.35*
"B" Cr-Mo	0.95	1.10	0.60	0.80	0.45	0.65	0.15	0.25	.....	0.25*	.....	0.35*
"C" Cr	0.95	1.10	0.60	0.80	0.65	0.85	.....	0.06*	.....	0.25*	.....	0.35*
"K" Mo	0.90	1.05	0.60	0.80	.....	0.20*	0.20	0.30	.....	0.25*	.....	0.35*
0.5 pct Mo	0.90	1.05	0.25	0.45	.....	0.20*	0.40	0.60	.....	0.25*	.....	0.35*
Mn-Mo	0.90	1.05	1.35	1.65	.....	0.20*	0.20	0.30	.....	0.25*	.....	0.35*

Sulfur 0.025 max; phosphorus 0.025 max; silicon 0.25-.45.

* Incidental

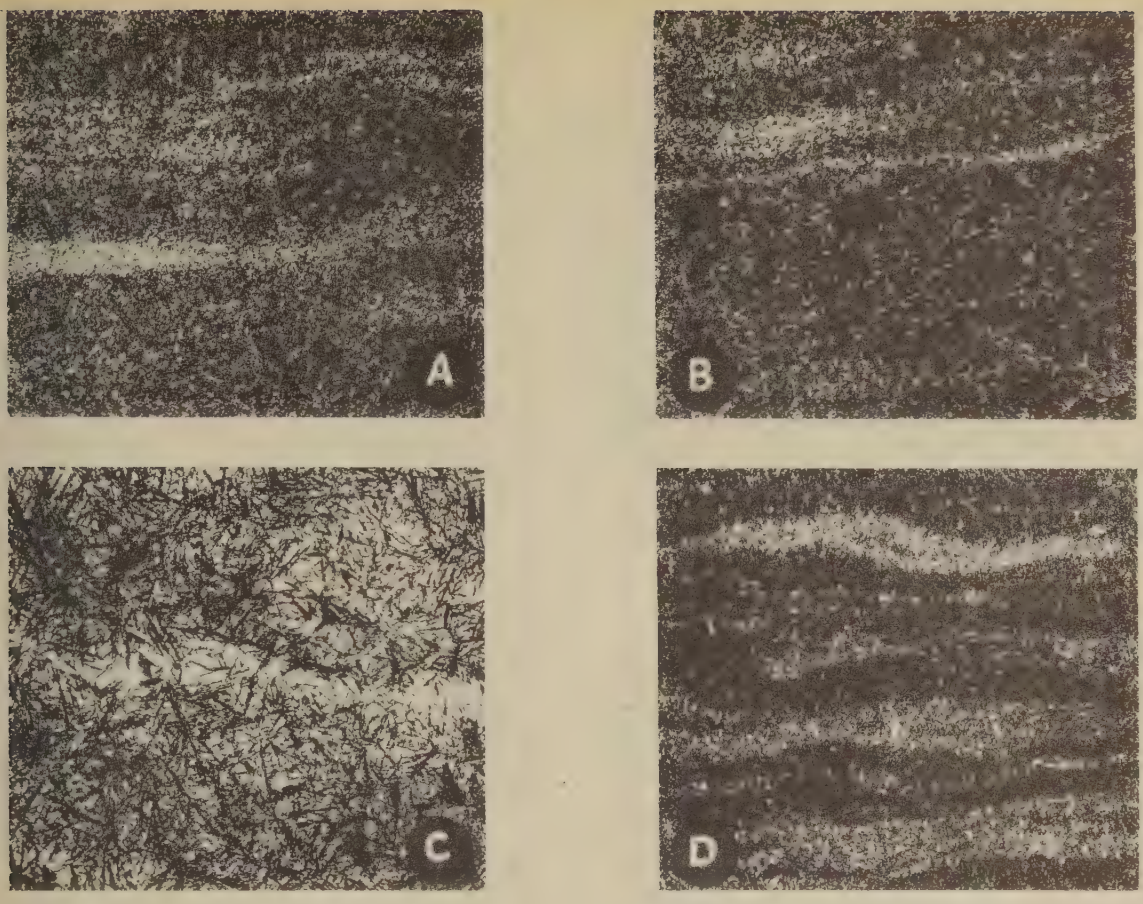


FIG. 7 - Carbide bands in E-52100 ball bearing steel. Photomicrographs illustrate the persistance of carbide segregation. Etched Nital. 100X. (A) oil quenched from 1550°F, (B) oil quenched from 1550°F and requenched from 1650°F, (C) oil quenched from 1550°F and requenched from 1900°F, (D) oil quenched from 1550°F, requenched from 1900°F and requenched from 1550°F.

listed in table II is shown in table V. Composition-wise, manganese and molybdenum have been used to replace whole or part of the chromium content in arriving at the new analyses. Subjecting them to the same scrutiny as E-52100, chemical analysis ranges can be set up as shown in table VI. Again a variation in chemical composition from the specified ranges as proposed in table VI, unless hardenability is an important factor, would be of little importance except as to the phosphorus and sulfur contents.

Some years ago, when steelmaking practice was in a less advanced stage, macrostructural appearance after deep etching was of extreme importance. Steel mills are now so aware of this test that it is rare that steel is ever rejected by the consumer for failure to meet a reasonable standard of porosity. However, there is one type of defect shown up by this test which makes it a valid part of a consumer inspection program and that is called "internal bursts" which can arise from improper heating and cooling of billets for rolling and improper control of temperature in the piercing of tubes. This type of defect is shown in fig. 4. Of the special steels listed in table II, designations A, B, C and K, with WPB sponsored steels, were examined in the form of bars and tubes; designations 0.5 pct Mo and Mn-Mo were examined in bar form only. No defects were apparent after deep etching and visual examination. Apparently, they lend themselves to the steel mill processing without difficulty.

Nonmetallic inclusion examination is part of the metallurgical inspection procedures of most bearing manufacturers. The presence of nonmetallic inclusions is considered detrimental to the life of ball bearing race rings, and indeed, may also cause scrap loss in the final polishing operations on the race ways, as illustrated in fig. 5. Oertel[4] writes in reference to the importance of the cleanliness of the steel and its effect on the life of a finished ball bearing as follows:

"Nonmetallic inclusions and segregations constitute the centers from which premature failure of the track face may start. The foreign particles which break up the metallic continuity of the crystallites are dislodged and roughness results, which gives fatigue an opportunity to assert itself thus possibly leading to rupture of the bearing and heavy damage to the machine as a whole. For this reason, it has always been a principal aim to produce a steel as clean as possible. Unfortunately, heats of steel cannot be worked so as to avoid entirely the formation of nonmetallic inclusions. For this reason, efforts must be made to discard all defective material by close inspection of steel and bearings during the process of manufacture."

The method of specifying the degree of freedom from nonmetallic inclusions is not standardized by consumers. There are three methods of rating inclusions; by counting, by examination of visual comparisons with a standard chart, or a combination of both. A combination method

using charts and measurements is covered in the current SAE handbooks[5] and in the current ASTM Standards[6] under the designation E-45-46T. These examinations are made at 100 diameters on a polished, unetched microspecimen.

There are a number of technical articles dealing with the sampling and evaluation of inclusions in steel. For example, Alisanova and Popova[7] made an experimental study of the best procedure in taking representative steel samples for inclusion count. They studied the distribution of silicate and sulphide inclusions in ingots of Cr-Mo-V steel. Alisanova[8] describes a numerical evaluation of inclusion content of steel, and Semenenko[9] in an article entitled "Oxides in Ball Bearing Steel" discusses the use of aluminum and silicon as deoxidizers. Diergarten[10] describes the classification of ball and roller bearing steels according to inclusion content and states that "The inclusion content is of especial importance

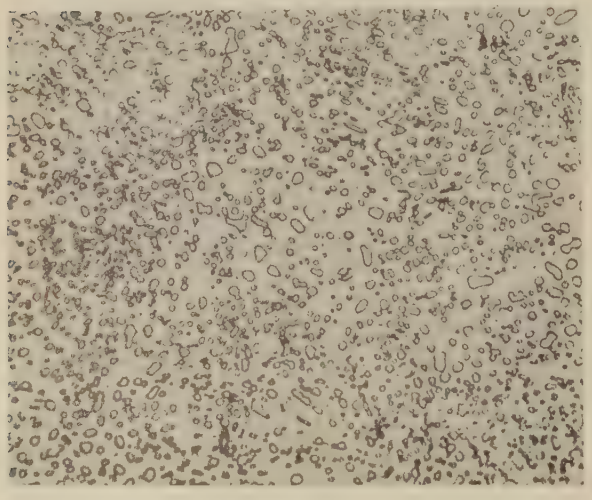


FIG. 8 - Ideal annealed microstructure; 1000X, etched 2 pct Nital.

for ball and roller bearings because it profoundly affects their useful life."

The author has examined and recorded inclusion content of electric furnace steel 52100 made in this country by several manufacturers and steel made in Sweden and Germany by other practices. As a result of these studies certain generalizations are possible: (1) over a 15-year period there has been a marked improvement in the cleanliness of electric furnace bearing steel made in this country, (2) German-made steels are comparable in cleanliness rating, and (3) Swedish-made steels have a high degree of freedom from nonmetallic inclusions. However, the variation from heat to heat is greater than the variation from source to source whether it be from mill to mill or country to country.

As to the effect of inclusions on the life of ball bearings, the considered opinion is that they are detrimental, although no actual accelerated life test data is available to prove this. The author recalls an attempt to improve the machinability of E152100 by the addition of lead to an ingot, which resulted in the production of steel with an extremely high inclusion rating. Accelerated life tests were run on bearings containing inner race rings made from this steel, for which data are presented later in this article. Whether the results of these accelerated life tests can be used to prove the undesirability of a high inclusion content or not is a controversial issue; in the author's opinion it can be so interpreted.

Inclusion counts of samples from the special steels covered in table II showed that the material was within satisfactory limits. Microstructural examination was made for three reasons: (1) to determine the degree of carbide segretion, (2) to evaluate the structure produced by annealing where annealed steel is purchased, and (3) to determine the extent of surface decarburization.

It is a general opinion that carbide segregation, see fig. 6, is detrimental to the life of a ball bearing race. It is a function of steelmaking, and cannot be removed by heat treatment (illustrated in fig. 7).

Oertal[4] has something to say with respect to carbide segregations, "just as nonmetallic inclusions, pronounced carbide segregations on the track face of the ball race also lower the life of a bearing. The hard chromium carbides are dislodged and the polished track becomes rough." Remin,[13] who also studied carbide segregations in ball bearing (1 pct C, 1.5 pct Cr) steel, associates carbide segregations with hair-line cracks that form in rolling operations. He also states that segregated steel cannot be heat treated to a desirable uniform structure, and, consequently, dependable performance of parts cannot be expected.

An ideal annealed structure, illustrated in fig. 8, consists of fine spheroidal carbides in a matrix of ferrite. The complete absence of pearlite is desirable because of its detrimental effect on machining; this is illustrated in fig. 9. The carbide spheroids should be relatively small and of uniform size, as this makes for uniformity in heat treating. As previously stated, however, annealing cannot eliminate nonuniformity caused by carbide segregates.

Rauzin[12] studied the influence of initial structure on the mechanical properties of quenched 1 pct C, 1.5 pct Cr bearing steel, using specimens with a number of different microstructures ranging from fine lamellar pearlite (302 to 321 Bhn) to coarse pearlite (217 to 228 Bhn), and fine spheroids to coarse spheroids. He states that each different initial structure has its own range of quenching temperatures. His mechanical tests consisted of bend tests and he concluded that the most favorable combination of strength and toughness and also of hardness is shown by the fine spheroidal prestructure. Wear tests were also a part of his study. Alternating load tests were also made from which he concluded that a maximum value of fatigue limit is obtained with a uniform structure of fine spheroidal carbide as the initial structure. He proposed that ball bearings made with a preliminary treatment of the steel for spheroidal carbide gave a life of about 20 pct longer than ball bearings having an initial structure of fine lamellar pearlite and subjected to the same quenching conditions.

The microstructural examination is usually supplemented by hardness checking for, by using hardness tests, either Brinell or Rockwell B, one can inspect a large number of units in a steel

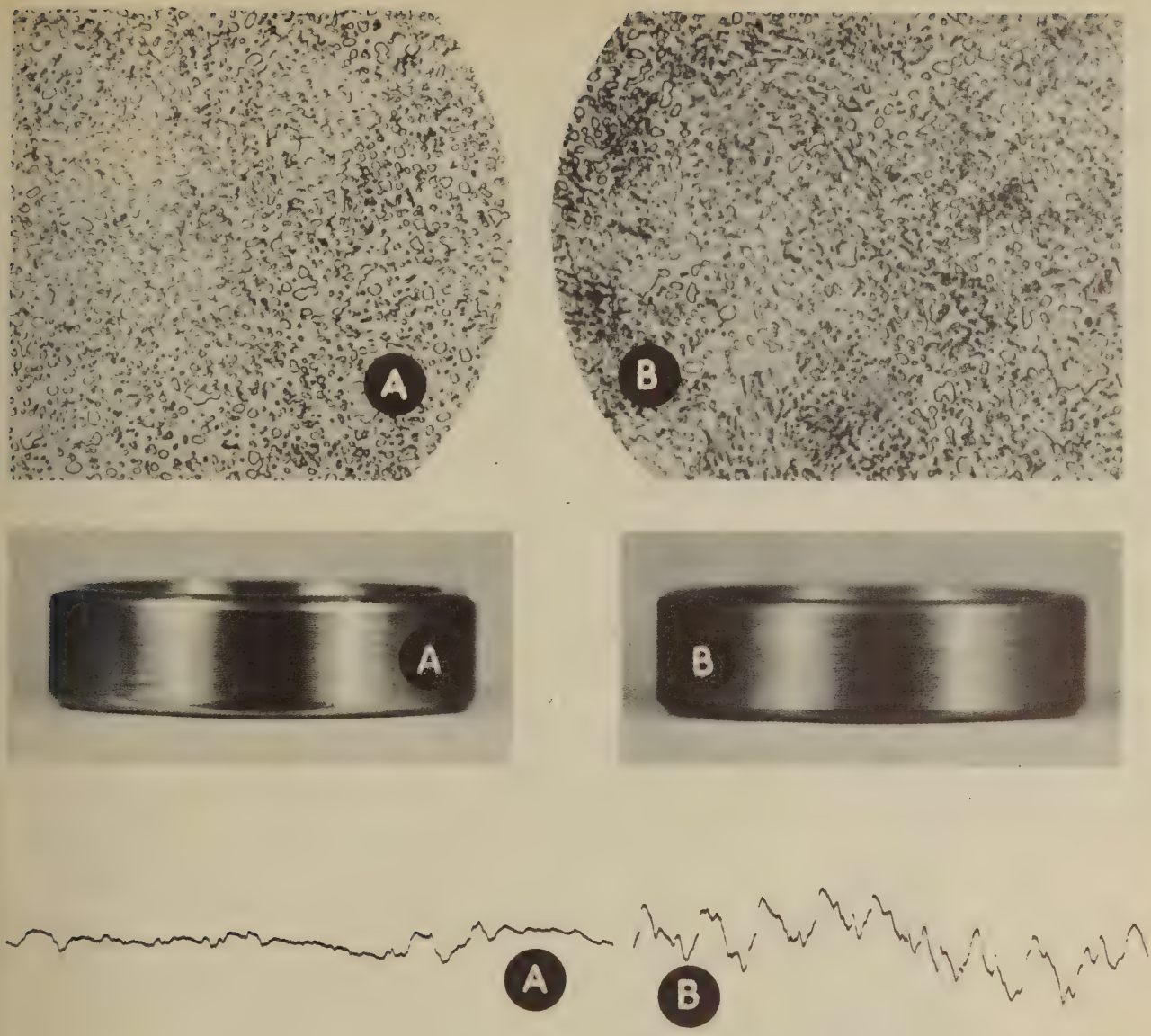


FIG. 9 - Rough ring surface caused by the presence of lamellar pearlite in microstructure (B) as compared with (A) which shows no lamellar pearlite.

shipment. The hardness limits for good machinability are 166 to 195 Bhn or 85 to 92 RB except that for bars cold drawn after annealing, the upper limits are 225 Bhn or 102 RB max. Machine straightening may also cause an increase in the surface hardness of a bar, raising the maximum Brinell to 217. There are tubes which are given a work hardening treatment in special machines for increased tube accuracy and machinability and in this case the maximum hardness limits might exceed 255 Bhn. Where the hardness limits are in excess of 195 Bhn, hardness checking cannot be used to replace microstructural examination. A microstructural examination for surface decarburization is applied to annealed bars and tubes. Certain maximum limits are set up for various sizes of bars and tubing. Modern annealing practice is concentrated on restoring carbon to the surface of bars or tubes by the use of certain furnace atmospheres.

It would be valuable here to refer to the use of fracture testing (ASTM E-45-46T).[6] This test was widely used in the evaluation of ball bearing steel and consists of hardening discs from bars or tubes, fracturing the discs and examining them. The test included, if extensively applied, essentially the same information that is obtained from the macroetch test and the microstructural examination for inclusion content and carbide segregation.

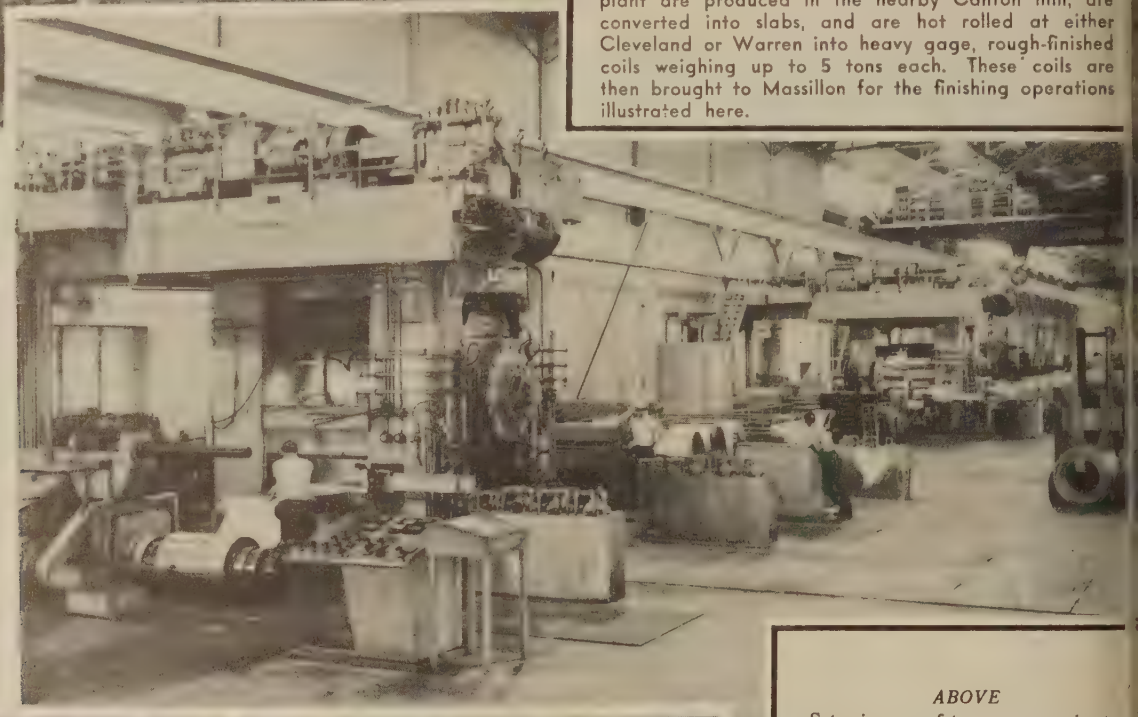
Erlander and Bertel[13] in their study of the effect of oxygen on the properties of steel, used the fracture test to evaluate the nonmetallic inclusion content of ball bearing steel. By the use of this test they were able to correlate the oxygen content of the steel with quality, showing that as the oxygen content increases, the rejections due to inclusion content increase. The special steels (table II) were submitted to microstructural examination and hardness tests in the annealed condition. The structure consisted of spheroidal carbides in a matrix of ferrite, as illustrated in fig. 8, except that the carbide particles were a little larger.

In a subsequent issue, the author will present hardenability data for various bearing steels and will indicate the influence of various metallurgical factors on hardenability.—Ed.

Republic Opens

REPUBLIC OPENS NEW STAINLESS FINISHING MILL

Facilities at Enduro Plant No. 2, Republic Steel Corporation's new stainless finishing mill in Massillon, Ohio, seen at the left, are shown on these pages. The mill will produce stainless sheets in widths up to 60 in., supplementing Enduro Plant No. 1 where flat-rolled stainless in widths up to 30 in. is produced. The basic electric furnace ingots for the Massillon plant are produced in the nearby Canton mill, are converted into slabs, and are hot rolled at either Cleveland or Warren into heavy gage, rough-finished coils weighing up to 5 tons each. These coils are then brought to Massillon for the finishing operations illustrated here.



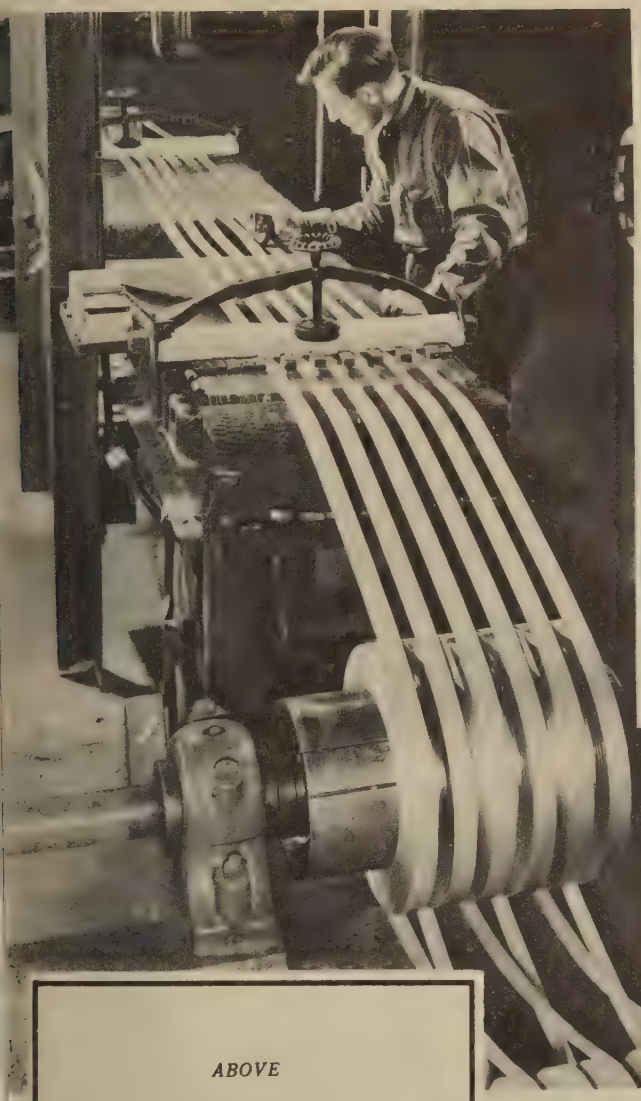
ABOVE

Strip, after passing through one of the breakdown anneal and pickle lines, is cold reduced from a maximum of 0.300 in. to finished gages as light as 0.015 in. on the two 4-high mills shown. In the foreground is a 54-in. mill and in the rear is a 66-in. mill, both of which use 16½-in. diam rolls. The plant also uses a 66-in. temper or skin pass mill after the finish anneal and pickle.

LEFT

Work roll from one of the reduction mills being reground. Surfaces must be flawless to prevent scratches or imperfections on the steel.

ew Stainless Finishing Mill



Parallel stainless strips emerging from an annealing furnace. From the furnace the steel goes through pickling baths where washers and scrubbers assist the acid action in removing scale.

ABOVE

Stainless which has been slit into strips being gaged at an inspection table.

o o o

RIGHT

Polishing machines give a mirror finish to the stainless after it has been cut to the desired sheet sizes.

Mass Producing 15-Ton

Standardization of production methods and equipment and extensive utilization of arc welding are features of the planned production of bulldozers at Le Tourneau's new Longview, Texas, plant. Fixtures, jigs and holding devices for machining and welding assure uniformity of quality and optimum production.

THE engineering, planning, and establishing of facilities for the mass production of the Le Tourneau Corp.'s combined prime mover and bulldozer for heavy earthmoving represents a production program of major proportions. This 15-ton arc welded machine, represents a marked departure from the construction of similar units used on all major earthmoving operations prior to and during World War II. It is unique in that the prime mover and bulldozing machine are designed specifically for that function rather than using a standard track type tractor and attaching an auxiliary power control unit and bulldozer attachment for the purpose of pushing earth or other earthmoving units in front of the tractor.

It is powered by a 180 hp diesel engine and operates on four 5½ ft heavy-duty rubber tires, the engine and tires being the only major items purchased for its production. This unit was experimentally developed during the summer of 1946 and was placed in mass production in the new Longview, Texas, plant of the LeTourneau Corp. built early in 1947 for the production of these units and steel forms for concrete housebuilding. The main assembly line shown in fig. 1 has been functioning regularly since April, 1947, and is being expanded progressively to shorten the assembly time rquired.

Since there are more than 3000 completed parts and structures in the final assembled unit, the warehousing, manufacturing, assembling, and finishing facilities for its production on a large scale must of necessity be rather extensive. Over 1500 individual parts and structures are produced, largely from rolled steel, in the various processing departments.

The main frame and transmission case, the speed shifting transmission, wheels, brakes, steering mechanism, control valves, and the final drive mechanisms represent the major items of production.

The important manufacturing processes involved are: (1) The various cutting processes of steel bars, plates and shapes. (2) Forging and forming. (3) Machining moving parts such as gears, bearing cages, axles, brake friction and housing elements and the major transmission case structure. (4) Heat treating. (5) Arc Welding on a mass production basis.

The development of the bulldozer proceeded concurrently with the erection of the building. This plan of action provided a significant saving of time in that the fabrication of transportation buggies and equipment, the overhead crane, jib cranes, monorails, warehouse storage bins and fenced storage areas, tool cribs, tool racks, die

Bulldozers

By WALTER J. BROOKING
Le Tourneau Technical Institute, Longview, Texas

racks, and storage facilities, coincided with the erection of the building and was completed about the same time that the last of the roof was placed on the factory building. The experimental unit was finished early enough so that extensive field tests and experimental modifications of the unit were completed early in 1947, and the major program of tooling for its mass production was well under way in the early months of 1947. Over $1,000,000 worth of bulldozers and other equipment has been produced and sold since June 1947.

The tooling plan and layout for the factory includes more than 550 machine tools; over 350 arc welding machines (over 90 pct of which are ac transformer type arc welders); and over 100 auxiliary machines such as acetylene generators, oxygen plant, compressors, transportation motor trucks, and lift trucks, portable yard cranes, and electrical power and distribution units.

Raw materials, mostly in the form of steel, are unloaded and placed near the machine which will use them. Plate steel is stacked on the floor; and bars, angles, and shapes are stored in special arc welded steel racks near the machines where they will be processed, where jib cranes can take them from the racks and place them in the machines without the use of the overhead crane.

Three large mechanical flame cutting machines with three tips each and several small tractor flame cutting machines are used for the cutting plates for large welded structures. Since most of the cutting is of a repetitive nature, permanent templates are made for such flame cutting operations.

Hand flame cutting is used for cutting certain channels and angles to the proper shape and size; hacksaws for cutting bars. A large plate shear facilitates cutting many parts for the welded structures.

Considerable forging and forming of parts is done in the production of the main product of

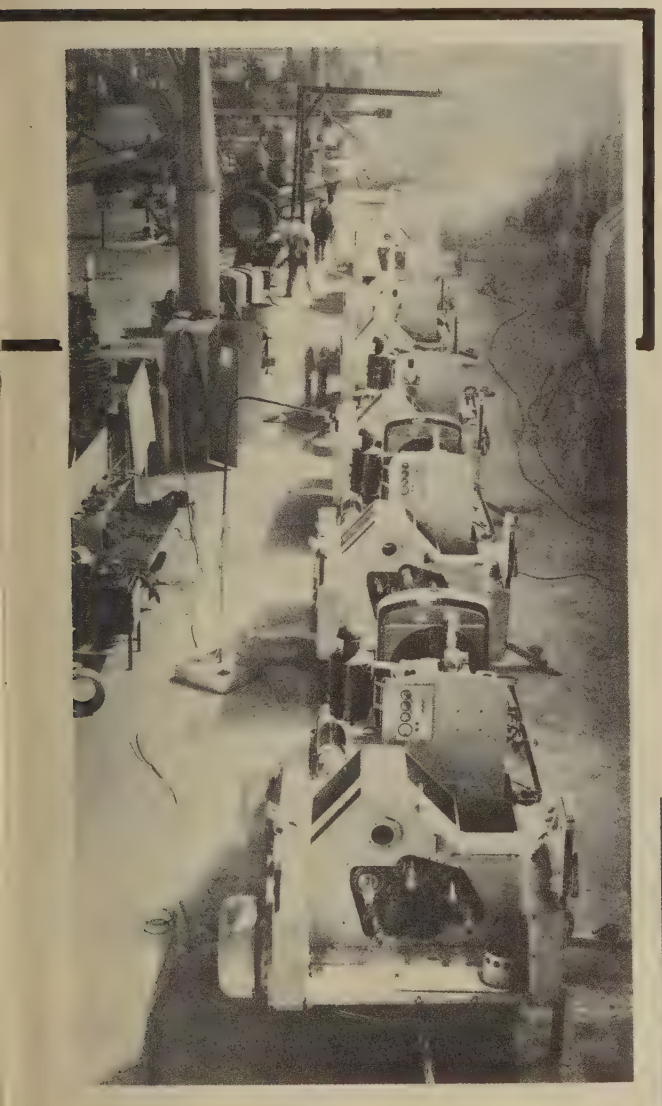
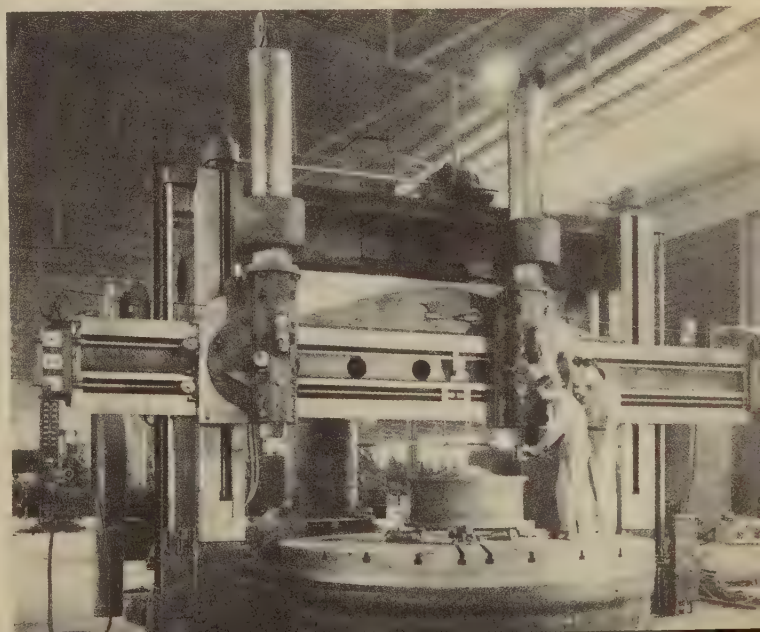


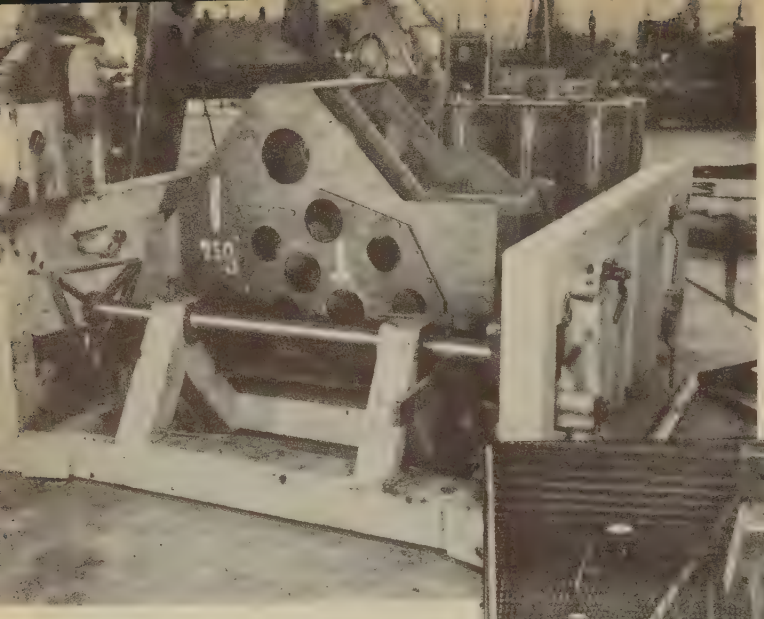
FIG. 1 - On the final assembly line, the welded and machined transmission case is placed on a buggy and moved from station to station.

FIG. 2 - This 144 in. boring mill is one of the many special machines for building experimental machines or special production tools.



the plant. A 6-in. upsetting machine produces many smaller gear blanks, bearing retainers, forged pinions, and upset shaft forgings. The heating furnaces for such forging operations were built for the particular job by the LeTourneau plant.

The 5000-ton Betts hydraulic press shown in fig. 2 provides press capacity sufficient to press forge large gear blanks and form large plate parts. A 500-ton mechanical press and a small punch press are also used for forging, blanking of parts.

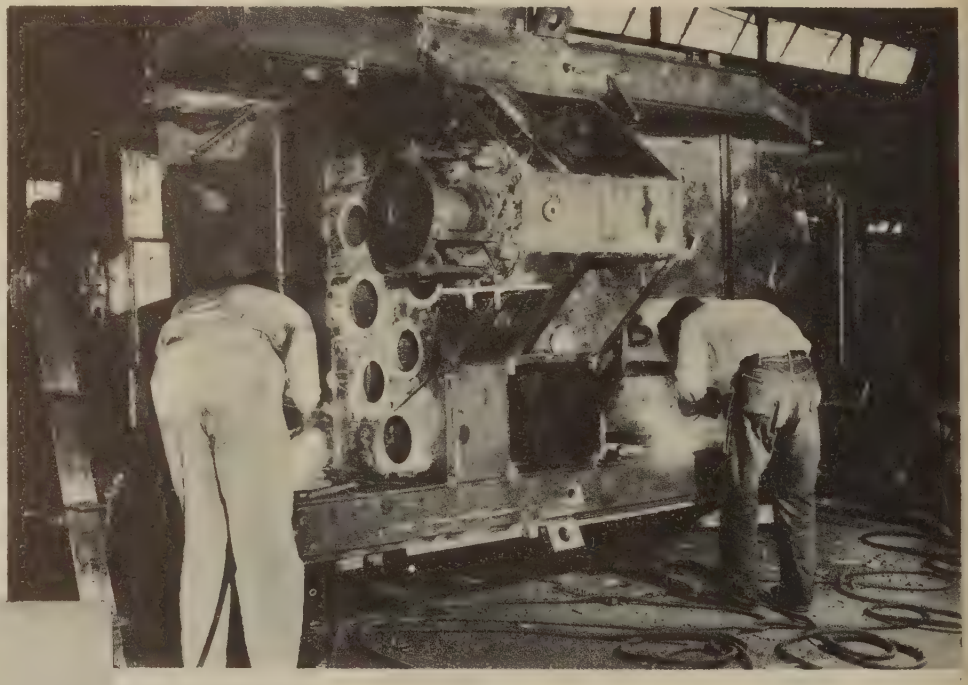


ABOVE

FIG. 3 - Welding setup jigs such as this standardize the fitting together of the parts of the main transmission case, prior to final welding. A universal positioning fixture for final welding is shown in the background.

RIGHT

FIG. 4 - This power driven universal positioner allows for the most economical positioning and welding of the main transmission case structure.



RIGHT

FIG. 5 - After the transmission case is machined, brackets, motor hangers, power control unit hoist cages, sheave housings, and other parts are welded to the structure.

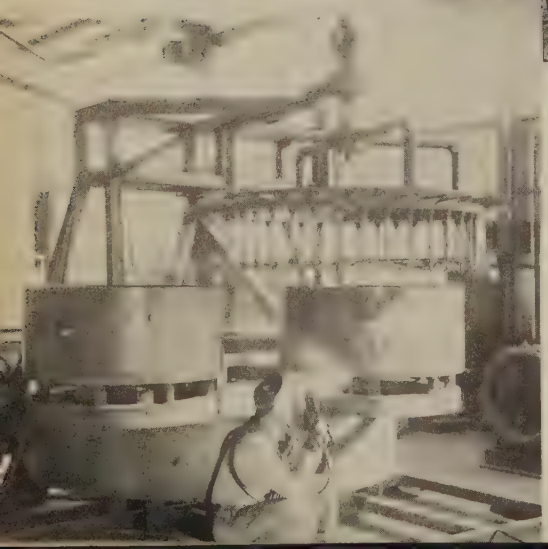


FIG. 6 - This special semi-automatic gear flame hardening unit is being built for the heat treatment of the 23 in. final drive gears.

Because of the importance of arc welding production, care in tooling has been exercised in the building of jigs and fixtures for the welding process. A prime requisite for all mass production programs is the production of jigs, fixtures, and tooling which provide the basic pattern for processing parts and structures so that a high degree of faithful standardization is accomplished.

The large main transmission case and final drive structure are set up and tack welded to-

gether in the setting up fixture shown in fig. 3. This particular unit sets together three smaller welded substructures that are previously set up in their own setting up and arc welding fixtures. Great care was exercised in designing setup fixture so that the main transmission case would be produced with a high degree of accuracy and uniformity. Careful observation of the effects of arc welding, and compensation for the slight distortion caused by the heavy welding were designed into the setting up fixture in order to provide finished cases that are uniformly true and similar in dimension.

The major welding for the final drive case structure is done in the fixture shown in fig. 4, which provides the universal positioning of the weldment to allow for welding in the most economical position for each weld. In most cases, this is a downhand weld where ¼, 9/32 or 5/16 x 18 in. welding electrodes using ac welding machines are used.

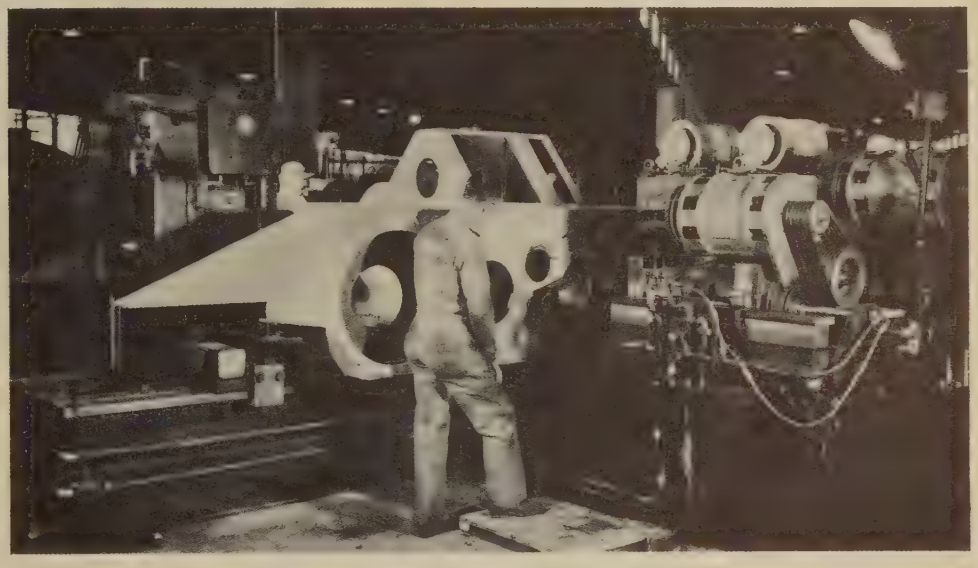


FIG. 7 - The boring and facing operations upon a final drive case are performed on this special semi-automatic boring machine in about 6 hr, compared to many times that long on a jig boring machine.

Engineering of the arc welding involves not only the setting up and welding fixtures as described, but also a system of welding engineering symbols showing the essential elements of the welding procedure for each structure or completed weldment.

A procedure for each structure tells the operator in what position and in what sequence the welds on the structures are to be made. This is important because it provides a uniform procedure for the deposition of welds and provides the basis for the control of the distortion from arc welding which, when uncontrolled, often gives rise to variations in the completed structures. These are difficult to predict and expensive and difficult to correct.

Supplementing the sequence of weld deposition, the series of welding symbols on the print for each structure or weldment gives the following information: 1—Weld size. 2—Weld location. 3—View of the cross section of the weld showing form and contour. 4—Position in which the weld is to be deposited. 5—Size of electrode used for each pass. 6—Number of passes in each weld. 7—Type or designation of electrode. 8—Machine setting for each pass in amperes. 9—Length of intermittent welds.

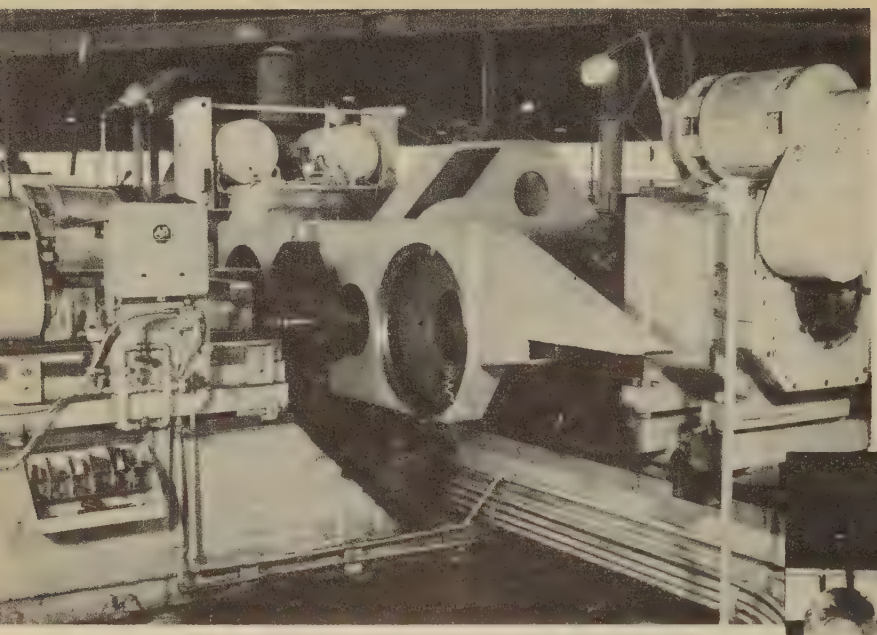
The use of this control is considered important because it provides the basis for a standardized operation and a standardized product.

An important advantage of the arc welded construction is the extent to which welding may be done upon a finished welded and machined structure, such as the final drive case structure shown in fig. 4.

This structure is not heat treated, normalized, or stress relieved after welding, and has considerable machining performed upon it. After it is finished on the welding fixture shown in fig. 4, the case structure is cleaned inside and out, painted on the outside, and sealed with a special crankcase sealer on the inside prior to the machining. This insures a cleaner machining and makes the larger structure more easily machined because of the visibility for marking, setting up, and measuring during the machining operation.

After the major machining on the structure is completed, it proceeds to another welding setting up and positioning fixture, shown in fig. 5, at which time motor hangers, brackets, and several other parts are tack welded in place and welded solid. The heavy walls of the case, together with the balanced construction, allow the *pull* of the finished weld at this stage of the operation to counterbalance each other, and leave the case true and free of significant distortion. The counterbalancing effect of one weld against the other provides a relatively distortion-free structure and alleviates the necessity of the stress relieving of such a large unit.

Because of the considerable amount of machining involved in the production of one of these bulldozing units, a considerable number of standard turret lathes, engine lathes, grinders, gear generators, milling machines, semi-automatic machines have been built by LeTourneau to do special machining more economically. The designing and building of special jigs and fixtures for the machining of parts on even relatively



LEFT

FIG. 8 - Separate machining heads bore and face the main bores from the sides, and other heads at each end bore and face the front and back of the case.

BELOW

FIG. 9 - This special semi-automatic lathe, capable of heavy cuts at high speeds, produces a complete bearing cage with each complete cycle; performing the first two and the last two separate operations on two bearing cage forgings per complete cycle.

standard machines, has been a major part of the tooling process.

Numerous drill jogs and special part holding fixtures with special stops, hardened bushings, tool guides, tool holders, special tools, or other features have been designed and built and are carefully stored and catalogued in the tool room when not in actual production use. Many of these remain upon the machine for which they were designed, being used in constant production on the same structure. Each setup is carefully designed and detailed, the tools labeled and numbered, and the entire setup described for duplication or other use, depending on systematic records.

The heat treating is a very important part of their production. Considerable use is made of flame hardening, especially in the production of numerous gears for the transmission and final drive assembly.

The special flame hardening unit shown in fig. 6 is one of several special flame hardening machines built for mass production purposes to provide scientifically controlled heating and controlled quenching of the structures.

The special advantages of flame heating lie in the elasticity or flexibility of the process, the low cost of the plentiful natural gas in the Texas area, and the precision with which both the heating cycle and the pressure quenching may be accomplished. The capital investment for such a unit is relatively much lower than required for the production of similar results by other methods. This is especially true where the quantity of production of the single part is counted in the thousands rather than the hundreds of thousands or millions; where the capital investment for tooling must be distributed over a somewhat smaller number of parts.

Several special machine tools have been built to do the basic machining operations upon some of the welded structures or individual parts where either the complexity of the machining process or the large number of parts justified the building of a special machine tool to accomplish the process. The large final transmission case boring mill shown in figs. 7 and 8 is an example of such a special semi-automatic machine tool.

The machining operation on the first unit built was performed on a large standard boring mill and required about three weeks elapsed time and over 300 hr of machining time. If this could have been done on a universal boring mill, which would have allowed setting up the structure only once and rotating it so that all machine surfaces could be approached without taking the part from the machine and resetting it, the operation could probably have been done in from 60 to 70 hr.

The special case boring mill shown in figs. 7 and 8 was designed and built to machine these cases. Two men operating this semi-automatic machine can do all of the boring, facing, and turning of the many surfaces in slightly over 6 hr. The resultant machining is standardized by virtue of a tooling setup which produces a uniformly machined product.

Separate machining heads approach the main bores on the sides of the case from each side and bore and face them simultaneously. Similarly, a separate head on each end completes the boring and facing operations on the front and the back of the case at the appropriate time in the machining cycle.

This special machine is comprised of a base with a broad faced set of ways upon which the case is fastened. When the case is moved.

(Continued on page 142)

Oxygen in Side Blown Converters ...

Realizing considerable success from the experimental use of oxygen in the side blown converter, a British firm has incorporated the technique as a production measure in its steelmaking practice. Reporting the results obtained on some 200 casts, utilizing 30 to 40 pct oxygen-enriched blast, the author discusses the effects on production rate, steel quality and refractory life. Cost data are also presented.

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British Iron & Steel Research Assn., London

USE of an oxygen-enriched blast has halved steelmaking time in side blown converters on regular production in a British steel foundry. The foundry concerned is that of Catton and Co., Ltd., Leeds, England, and extensive trials have been carried out in cooperation with the British Iron and Steel Research Assn. W. C. Newell and A. Hartley of the association and J. L. Harrison of Catton and Co. have observed and controlled some 200 casts from side blown converters with various oxygen concentrations in the blast.

Theory and experience have shown that oxygen enrichment in the pneumatic steelmaking processes should result in higher speeds and temperature increments. This indicated a possibility that lower initial temperatures might enable more scrap to be melted in the cupola, and probably less ferrosilicon added to the charge. In 1946, Kondakov published results of successful experiments with bottom blown converters in which the life of the refractory tuyeres did not exceed one heat. There were obviously, therefore, many factors to be watched in any production trials.

The dimensions of the side blown converters used for the investigations are shown in fig. 1. They are of a size common in British steel foundries, and have a siliceous monolithic lining about 13 in. thick.

Owing to the shortness of the body and nose of this type of converter, the blowing loss averages 10 pct and is higher than the more modern types. There are six silica-brick 2-in. diam tuyeres spaced 10 in. from the bottom of the vessel, which has a capacity of 40 cwt (1 cwt = 112 lb) increasing to 50 cwt during the life of the lining which, during normal operation and without general patching, is about 60 heats.

The rate of air blast before the trials started was normally 2700 to 3000 cfm at 3 to 3½ psi; the temperature of the metal from the cupolas was 1320° to 1340°C (2408° to 2444°F); and the cupolas melted 20 pct hematite iron and 80 pct steel scrap with ferrosilicon added to produce a

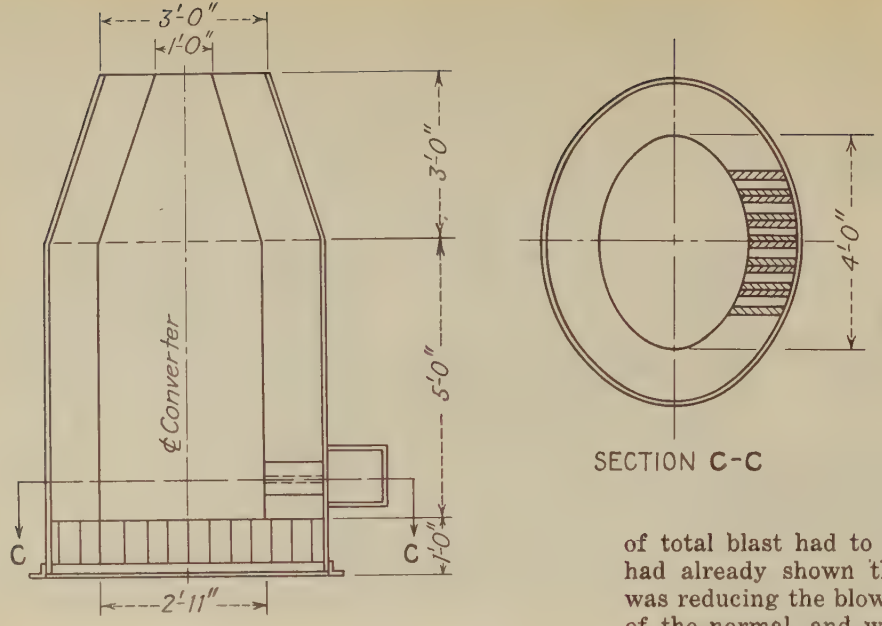

FIG. 1 - Sketch of a 2-ton converter such as was used for the oxygen investigations described in this article.

total silicon content in the molten iron of 1 to 1.2 pct. Fig. 2 plots the course of a normally blown heat.

The oxygen comes from an evaporator of 14,000 cu ft capacity and 1500 psi working pressure, via a series of large low pressure tanks of 14,000 cu ft capacity, at a pressure of 300 psi which feed 20 psi through a pressure reduction valve to the pipe from the blower.

The first intention was to maintain normal production routine as far as possible, and to inject additional oxygen into the air blast stream to increase the total oxygen content of the blast in 10 pct steps, starting at 30 pct. This increased the rate of air blast to 3600 cu ft per min at 40 pct oxygen, and although the time of the blow was thus reduced to between 4 and 6 min, an excessive blowing loss of 16 pct resulted. The total blast was therefore kept to 2700 cu ft per min with total oxygen contents of 30, 40 and 60 pct. Fig. 3 shows the effects of various degrees of oxygen enrichment in these circumstances on temperature, temperature increment, blowing time and blowing loss.

With the higher percentages of oxygen, the blowing losses were still excessive, and the rate of total blast had to be reduced. But the trials had already shown that the oxygen-enrichment was reducing the blowing time to about one-third of the normal, and was raising the temperature increment to 500°C as compared with the normal 300°C. This greater increment, moreover, was being obtained without the normal addition of about 0.4 pct Si to the bath. Since ferrosilicon in the United Kingdom is about £30 per ton (approx. $121 per ton), this is an important consideration. It is calculated that perhaps half the normal increment is obtained by means of added silicon.

The next series of trials was therefore made with a total blast rate of 2000 cu ft per min. The lower total blast rate resulted in a blowing loss of about 10 pct, which is the normal loss without oxygen enrichment. As the air blower was unable to deliver less than 1600 cu ft of air per minute, the maximum concentration of oxygen was 35 pct.

During the course of the trials, using 30 pct of oxygen, it was noticed that while at the commencement of the blowing operation a vigorous carbon flame was obtained from the mouth of the converter, this flame later decreased for a period and then increased again rapidly just before the culmination of what is generally recognized as the carbon elimination. It appeared that there was insufficient oxygen present or that

TABLE I

Details of Heats Blown With a Total Rate of Flow of 2000 cfm of Oxygen-Enriched Air, But With Pct Oxygen Raised From 30 to 35 Pct After 4 Min.

Duration of Blow, Min:Sec	Oxygen Added, Cu Ft	Total Oxygen Used, Cu Ft	Pct of Total Oxygen Derived from Oxygen Addition	Total Oxygen Used Theoretical Oxygen, Pct	Composition of Cupola Metal			Composition of Blown Metal			Weight of Cupola Iron, Cwt.	Blowing Loss, Pct	Temperature		
					C, Pct	Si, Pct	Mn, Pct	Pct C,	Pct Si,	Pct Mn,			Cupola Metal °C Immersion	Final Bath °C Immersion	Increment, °C
8:10	2600	5400	48	1.40	2.63	0.80	0.51	0.08	0.04	0.07	39	3.20	.....	1750	.....
8.30	2800	5900	47	1.43	2.70	0.63	0.47	0.13	0.08	0.12	39	3.90	1390	1740	350
7:45	2500	5100	49	1.22	2.63	0.50	0.42	0.07	0.10	0.13	40	11.20	1335	1710	375
8:44	2700	5900	46	1.41	2.65	0.61	0.43	0.08	0.15	0.13	40	5.10	1345	1720	375
11:10	3200	7100	45	.....	.....	.....	.....	.....	.....	.....	40	8.10	1340	1740	400
7:43	2600	5800	45	1.28	2.84	0.71	0.39	0.10	0.17	0.08	40	13.70	1380	1730	350
Av. 8:40	2730	5870	46.5	1.36	2.69	0.65	0.44	0.09	0.11	0.11	39¾	7.53	1360	1730	370

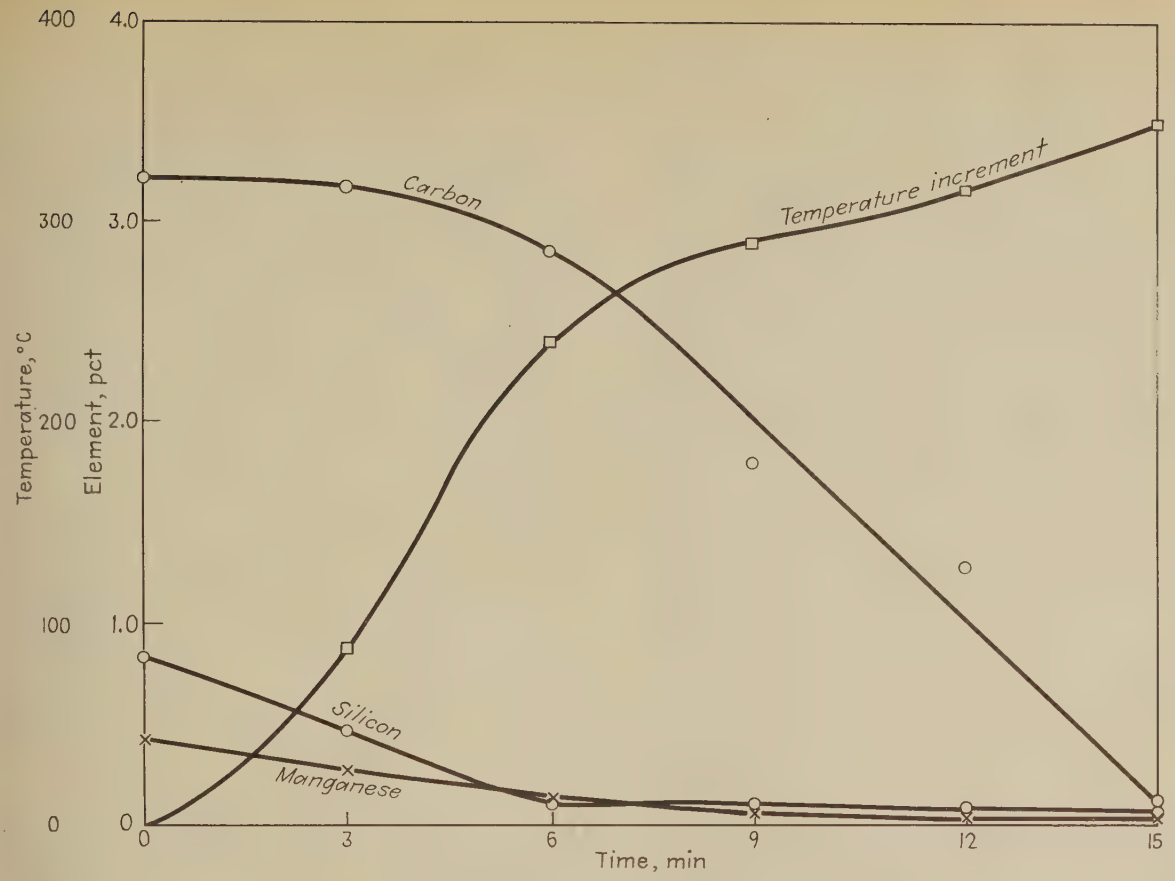

FIG. 2 - Chemical changes and temperature increment during normal sideblowing operations.

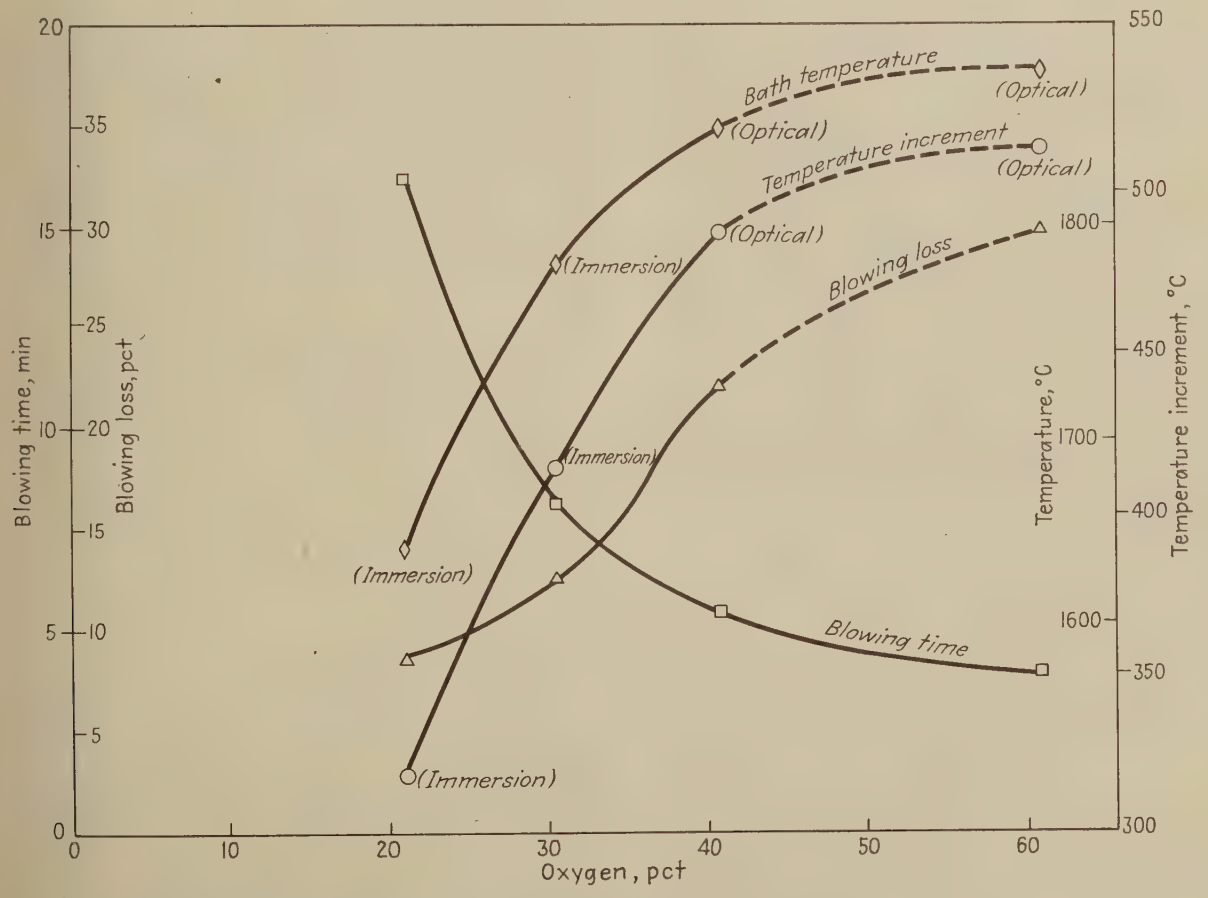

FIG. 3 - Final bath temperature, temperature increment, blowing loss and blowing time plotted against oxygen concentration in a blast of 2700 cfm.

the carbon combustion was being temporarily checked. For this reason it was decided to run a series of trials in which the oxygen concentration was raised from 30 to 35 pct at about midway during the operation, i.e., after about 4 min. The average blowing loss under these conditions was only 7.5 pct, an abnormally low figure.

This "hesitation" effect in carbon elimination and temperature increment was confirmed by a series of interrupted blows with 35 pct oxygen, charted in fig. 4. Individual results derived from the interruptions show such divergence that the averages have been plotted as dotted lines, and individual results have been indicated as well.

Another series of trials at a blowing rate of 2000 cfm of 30 pct oxygen was made, in which the charge was melted in a cupola from steel scrap only. The average temperature of the all-scrap iron after desulphurizing was 1315°C (2399°F) and the silicon content was 0.16 pct. Even so, the oxygen-enriched blast gave a temperature increment of 325°C (585°F) which enabled the charge to be cast satisfactorily.

It is possible now to assess the results of these trials in general terms.

(1) Quantitative effect on output:—Blowing time is, as the accompanying illustrations show, reduced by one-half with quite moderate oxygen enrichment of the blast. Side blown converters, however, are normally installed in foundries where melting capacity is adequate. This factor should not therefore be overweighted, although the flexibility of the process in relation to the variable demands in a foundry is enhanced.

On the other hand these results do suggest that there might be a future for larger furnaces of this type which, with an oxygen-enriched blast and a basic lining, might be employed for bulk ingot steel production.

There are also indications that blowing losses are reduced with oxygen enrichment. Reduction in the nitrogen content of the blast leads to a more efficient use of the total oxygen blown into the furnace, or a better "oxygen balance." The excess of total oxygen required over the theoretical total required is reduced by oxygen enrichment, and table I gives an indication of the order of saving that may be achieved.

(2) The quality of the product both of the liquid steel and the ingots or castings made from it:—These trials indicated that steel produced with oxygen-enriched blast was in no way inferior to that normally produced from the standpoint of chemical, physical and mechanical properties. Carbon contents were on an average the same as those normally obtained, but were actually more consistent. The results of statistical studies of oxygen-enriched heats over one month compared with a similar period of heats blown normally with air in the period immediately prior to the trials is shown in table II.

Other points checked in this connection were gas contents (O_2, H_2 and N_2); sulfur and phosphorus contents (which are affected by the greater proportion of scrap metal that can be melted in the cupola); micro-structure and inclusion count; and mechanical properties (ultimate tensile stress, yield point and elongation). In all cases the results appeared to be comparable with those obtained from normally blown metal.

It is also of importance that the higher temperature increments possible with oxygen-enriched blasts are valuable in foundries requiring high fluidity for the manufacture of thin walled castings.

(3) Effect on Refractories:—There was no

Oxygen in Steelmaking—Bibliography

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TABLE II

Statistical Summary of Carbon and Manganese Contents in Normal and Oxygen-Enriched Blows.

		CARBON				MANGANESE		
	Total No. of Casts	Average, Pct	Range, Pct	Readings Outside Range 0.23-0.27 Pct	Standard Deviation	Range, Pct	Readings Outside Range 1.4-1.6 Pct	Standard Deviation
Normal air blown (Sept. 1947)	89	0.24	0.20-0.32	20.2	0.0193	1.04-1.81	49.5	0.1671
30 Pct oxygen-enriched air (Feb. 1948)	129	0.25	0.19-0.30	13.1	0.0178	0.93-1.62	24.5	0.1420

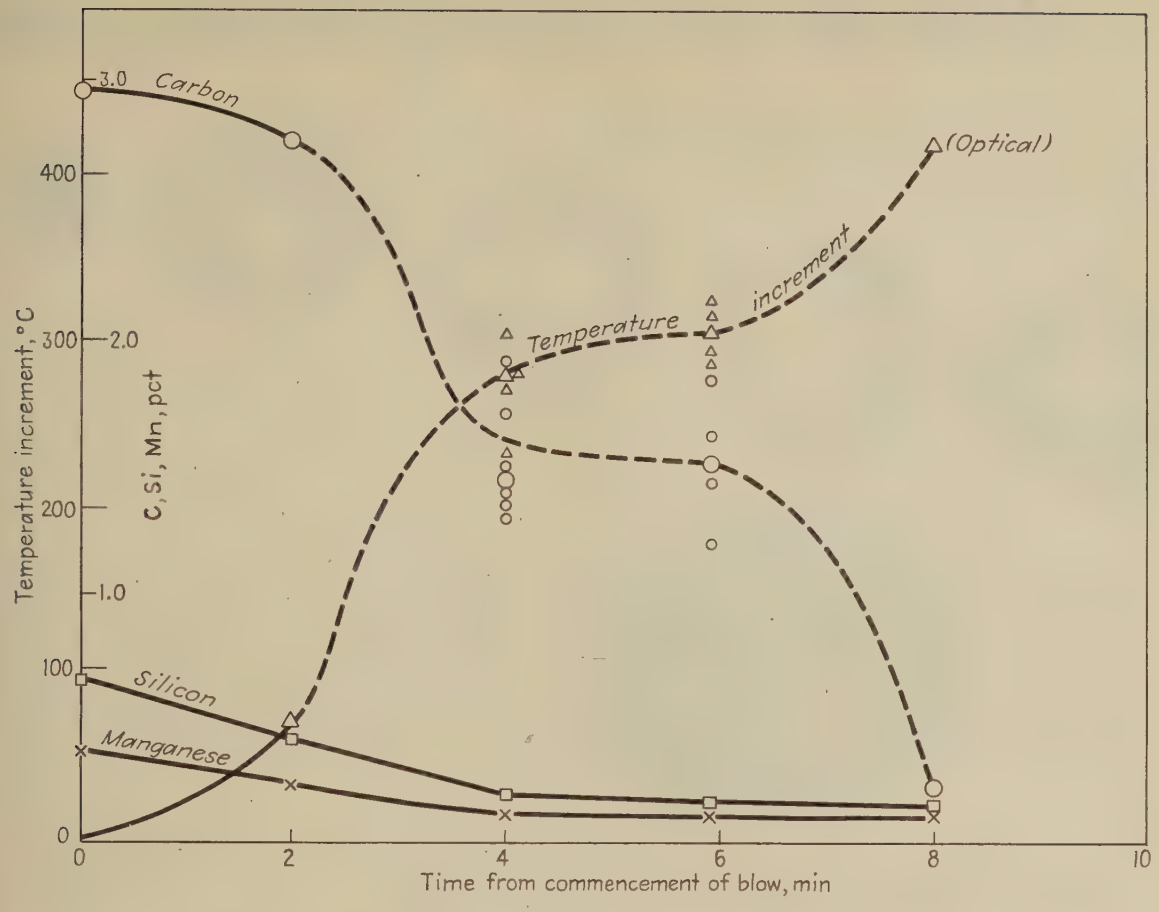


FIG. 4 - Chemical changes and temperature increment with air blast of 35 pct oxygen.

noticeable decrease in the average life of the linings during the progress of the trials. During the several months in which the tests were carried out no lining was exclusively operated with oxygen-enriched blast, but half the heats of many linings were with oxygen-enriched blows (usually to 30 or 35 pct) and in no case did a lining fail for this reason. Even greater blast velocities with 40 pct oxygen, tuyere wear was in the region of ¼ to ½ in. per blow, giving a life expectancy of 26 to 30 heats per set of tuyeres. The great reduction in blowing time insures that the bulk of the refractories do not, in all probability, reach a very high temperature, though the final temperature of the steel is, of course, much higher.

It is possible to make a comparison, evaluating the advantages and disadvantages resulting from the use of oxygen-enriched blast in the side blown converter. Apparent advantages are: (1) shorter blowing time and great flexibility, (2) higher steel temperature, (3) reduction in silicon and other fuel consumption, (4) more consistent composition of steel, and (5) conversion of the converter from a scrap producer to a scrap consumer.

The high cost of providing 1000 to 2000 cu ft of oxygen per ton of steel is the outstanding disadvantage.[1]

A capital cost of nearly £500,000 (about $2,015,000) has been estimated and a power cost per 1000 cu ft (at 0.6d (about 10¢) per kw-hr), of 8d (about $1.34) for a plant producing 300 tons of medium purity oxygen per day. It is also a fact that capital cost per ton per year halves itself between 30 and 300 tons per day, so that concentration of demand in reasonably large units is essential. As a scale it may be mentioned that one 2½-ton capacity side-blown converter working on about 35 pct oxygen-enriched blast consumes about 10 tons of added oxygen per week. Even so, it is understood that Catton and Co. is continuing with oxygen enrichment as a production measure now that the experimental tests have been completed.

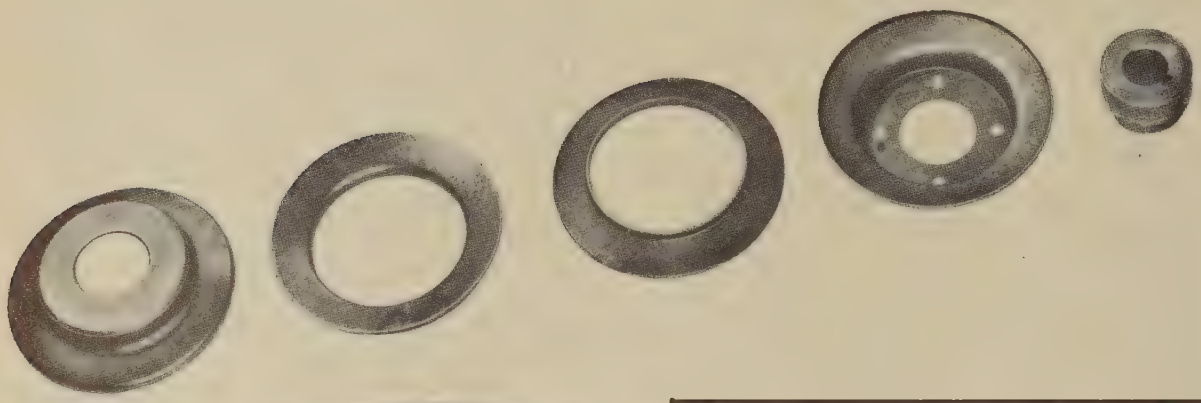
Assuming that the supply of compressed, or liquid, oxygen continues to be costly it seems probable that the most suitable plant for erection in moderate sized works in the United Kingdom might produce about 100 tons of 92 pct purity oxygen per day, using something like 340 kw-hr per ton.

On this basis there does seem to be a possibility of the useful development of the side blown converter for larger scale use, and work is now planned on its utility for the production of alloy steels.

There is also the point that the higher temperatures obtainable with the use of oxygen enrichment might make possible the exploitation by the basic bessemer of the large quantities of iron ore containing intermediate percentages of phosphorus.

[1] *For cost data relating to the United States, see "Low Cost Oxygen for Metallurgical Uses, by W. E. Lobo, THE IRON AGE, July 17, 1947, p. 49.*

Furnace Brazing Pulleys and



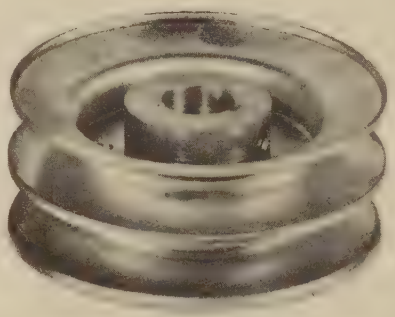
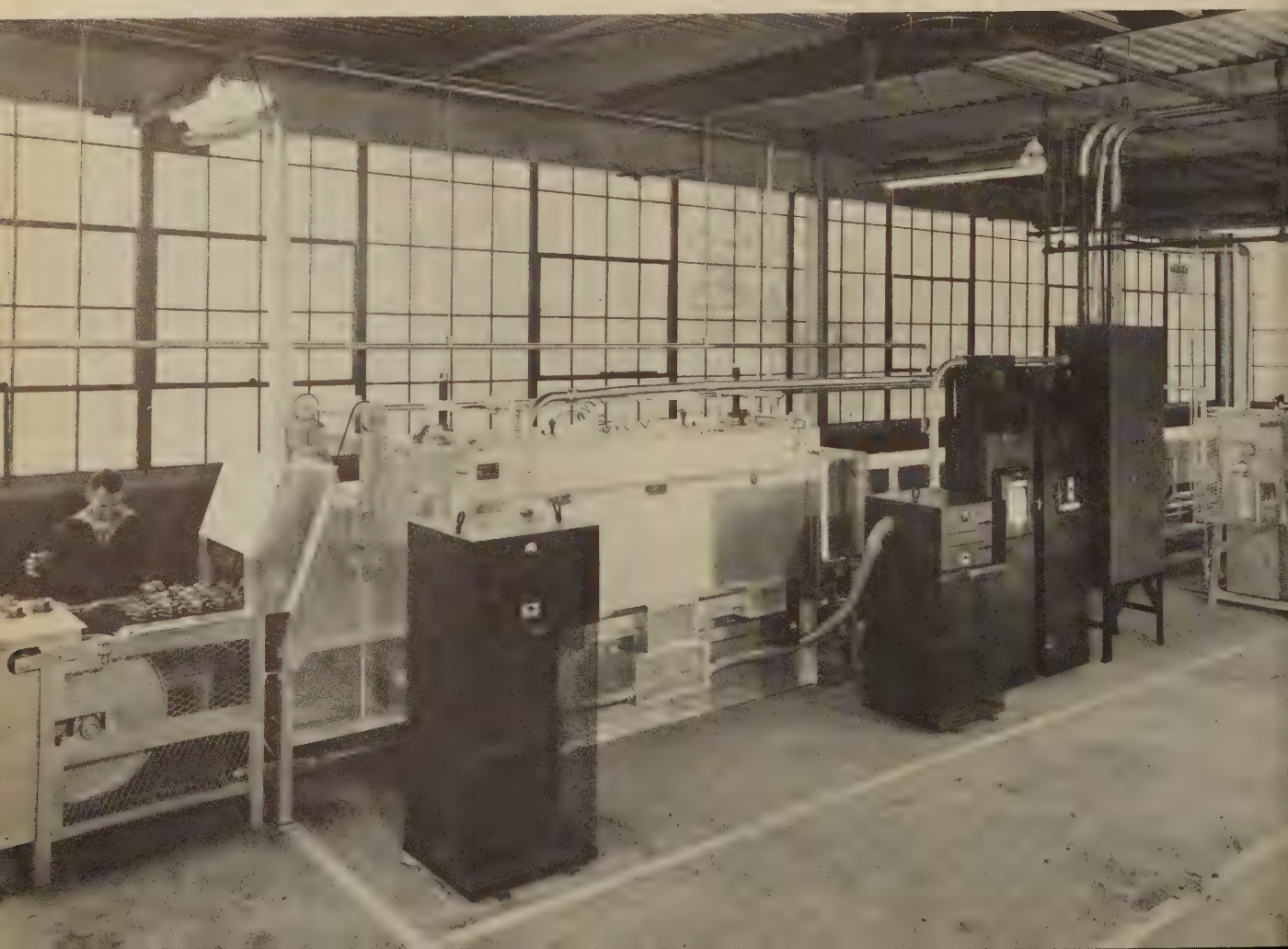


FIG. 1 - Power lawnmower pulley, a brazed assembly, and the components, four stamped sheet steel parts and a machined hub, that make up the assembly.

Use of a furnace brazed assembly for producing a power lawnmower pulley, which resulted in a reduction in manufacturing costs of 10¢ per part, is described in this article. A description of the furnace and operating costs are included in the article.

FIG. 2 - Mesh belt conveyor electric brazing furnace installation at Nelson Mfg. Corp. An atmosphere generator is visible at the extreme right foreground.



Sheaves Cuts Production Costs

By T. E. NELSON
Vice-President,
Nelson Mfg. Corp.
Pontiac, Mich.

USE of a brazed assembly in place of a casting for the power lawnmower pulley shown in fig. 1 resulted in a reduction in overall production costs of 10¢ per pulley, in addition to making possible more effective control of quality.

Pulleys and sheaves of the type shown in fig. 1 can be produced by various techniques, such as forming and welding, forming in one piece, and by casting. These methods are more costly than a brazed assembly. It has also been found that brazing produces pulleys, and sheaves that are substantially stronger than the spot welded types. Rejections in the brazed assembly average only one in 250,000 units.

In making the change from spot welded to brazed assemblies, an electric furnace installation costing $25,000 was required. It is believed, however, that this cost will be repaid in two years on the basis of operating data compiled to date based on 24-hr per day operations.

In press forming in one piece work of this type, it is necessary to make rather sharp bends in the steel, and this requires the use of a more expensive type of steel. It is also necessary to use more costly tools and dies. Producing pulleys as castings is also considerably more costly than brazing. Usually belt grooves and the center hole have to be finished machined in cast pulleys or sheaves, an expensive operation. With brazing no machining is required.

Typical of many of the brazing jobs performed at this plant is the power lawnmover pulley shown in fig. 1. This brazed pulley, which was formerly produced by another company as a casting, consists of five separate pieces plus necessary copper brazing wire and pellets, as shown in fig. 1. The components are stamped from low carbon cold rolled or hot rolled steel. Following stamping, the parts are washed and assembled. Next the assembly is spot welded in four places in order to hold it together properly during brazing. Copper wire and copper pellets are added, and the assembly then goes to the Lindberg Engineering Co.'s mesh belt conveyor furnace, fig. 2, for brazing.

Each pulley weighs 18 oz, is 4 in. in diam and 1⅝-in. wide. Pulleys are loaded in rows of three as shown in fig. 3. Loading of the conveyor belt is 10 lb per lineal foot. The belt, made of 80 Ni-20 Cr alloy wire, is ⅜ in. mesh, and 20 in.

FIG. 3 - Loading pulleys on the conveyor of the brazing furnace. The parts pass through a purging chamber before entering the heat zone.

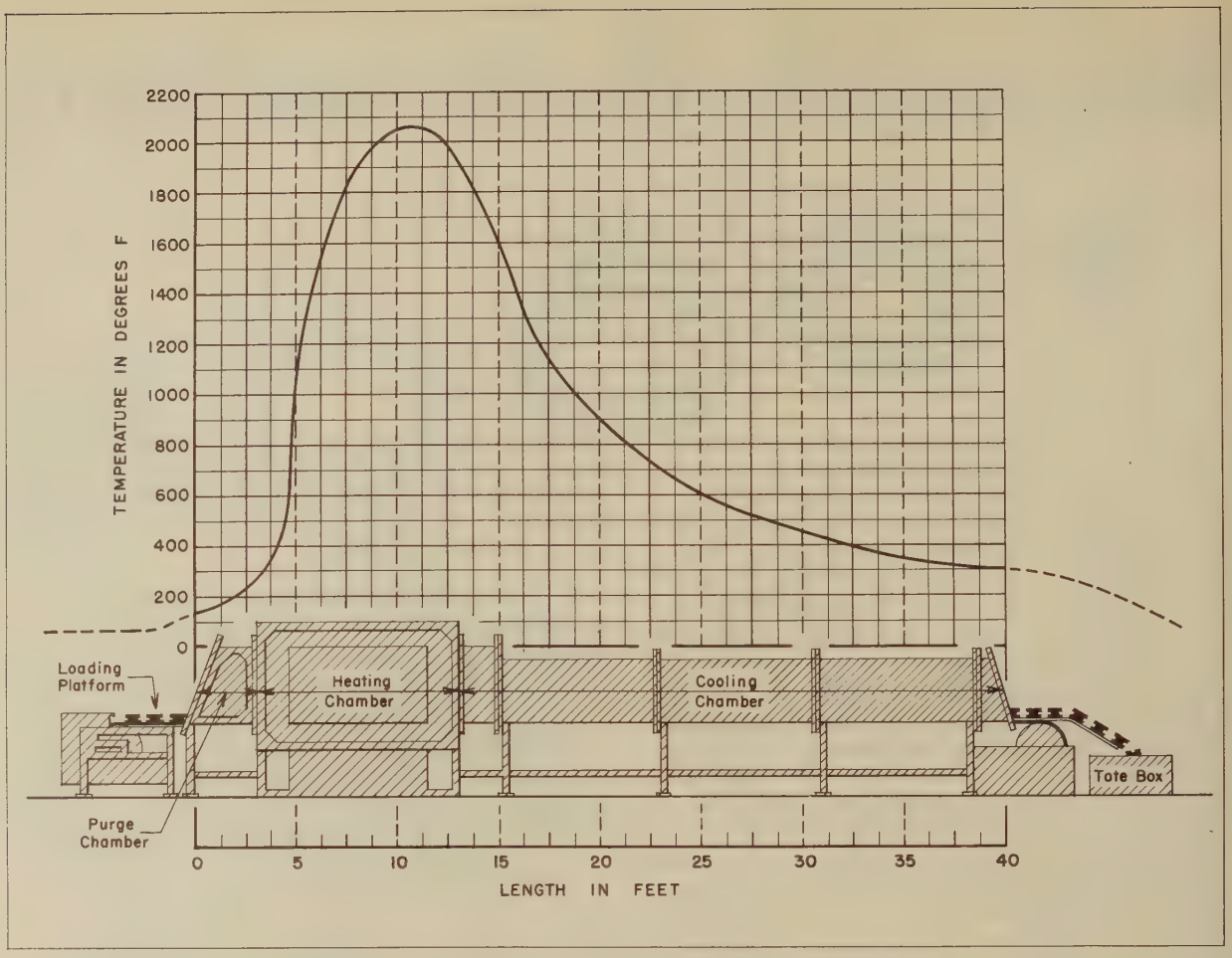


FIG. 4 - Relationship between the temperature of the part and its position in the furnace is illustrated in this sketch.

wide. Speed of the belt can be varied from 1.5 to 12 ipm by means of a Reeves variable speed transmission in conjunction with a speed reducer. Brazing temperature is 2050°F and the total brazing cycle is 49 min, consisting of 3¾ min in the purge chamber, 12¼ min in heating chamber and 33 min in cooling chamber. Hourly production is 385 pulleys (435 lb net, 750 lb gross). On this particular job production costs have been reduced 10¢ a pulley, as compared with the cast pulley, a production economy of $38.50 for each hour of furnace operation.

The furnace used is a mesh belt conveyor furnace with a heating chamber 20 in. wide, 8 ft long and 10 in. high, and a cooling chamber 24 ft long. Heating is by 30 Globar elements arranged in two separate zones. These elements are arranged so they can be changed in a matter of minutes without cooling the furnace. Protective atmosphere is supplied to both heating chamber and cooling chamber by a HYEX (exothermic type) reducing atmosphere generator shown in the right foreground in fig. 2.

Prior to entering the work chamber, the pulleys pass through a purge chamber 3 ft long. Any air that might be carried into the chamber when the parts enter is purged. Atmosphere from the work chamber passes through the purge chamber and burns off at the door where the pulleys enter the furnace.

From the heating chamber the conveyor belt carries the pulleys through a 24-ft long cooling chamber. This chamber carries protective atmosphere and is cooled by means of a water jacket that completely surrounds the chamber. Pulleys enter the cooling chamber at 2050°F and are cooled down to approximately 300°F by the time they reach the discharge end of the furnace. The temperature curve, and its relation to the position of the work in the furnace, is given in fig. 4.

Pulleys come from the furnace actually brighter than when they went in. The reason for this is that the reducing atmosphere, introduced into both heating and cooling chambers, actually reduces oxides existing on the surface of the metal.

Furnace operating cost is $2.156 per hr, calculated as follows:

Electricity: 95½ kw per hr, @ $0.02 per kwhr.	$1.910
Water: 60 gal per hr (this figure is estimated and covers water for the cooling chamber of the brazing furnace; 200 gal of water used each hour by the atmosphere generator is included in atmosphere cost shown below), @ $0.05 per M gal	0.003
1940 cu ft of atmosphere per hr, @ 12¢ per M cu ft	0.243
Total, per hr	$2.156

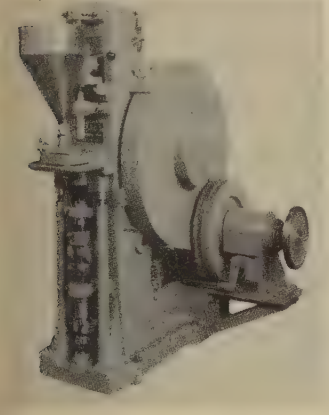
Other cast and forged parts have been redesigned to brazed assemblies and in every case use of brazing has resulted in reduced manufacturing costs.

New Production Ideas . . .

New and improved metal powder presses, plastic molding presses, a machine for cylinder block drilling, a special tapping machine, drill press vises, an underpass shaving machine, a roll lathe feed, and welding equipment are described. Among other items included this week are an air compressor clutch, testing machines, radiant heaters and a magnetic sweeper.

Metal Powder Press

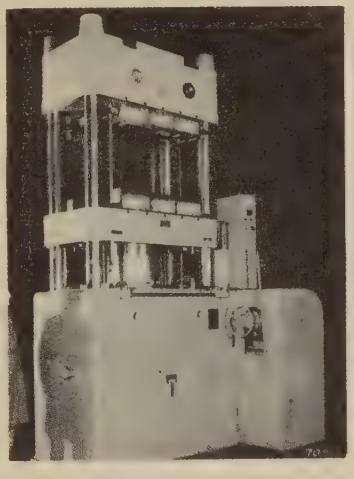
HIGH speed and economical production of powdered metal parts, including porous bearings, cemented carbides, iron cores, thin-walled bushings and blind end bearings, can be accomplished on a 12-ton press announced by *F. J. Stokes Machine Co.*, 5904 Tabor Rd., Philadelphia 20. It applies pressures up to 12 tons simultaneously from both top and bottom. Built into the machine is a movable core rod that can be arranged to drop before the die is filled and then automatically rush up from below to assure uniform distribution and a full die cavity before pressure is applied. This core rod can be locked in position to serve as a stationary core rod, capable of withstanding the full 12 tons pressure. The press can be operated with a compound or secondary lower punch, adjustable for stroke or pressure by a simple cam change. Maximum die fill is 4 in. and maximum diameter



piece that can be produced is ½ in. The press is powered with 3 hp variable speed unit drive, provided with a lever-operated clutch and brake.

Plastic Molding Press

A SEMI-AUTOMATIC plastics molding press with a pressure capacity of 500 tons has been built by *Hydraulic Press Mfg. Co.*,



Mount Gilead, Ohio, for molding large thermo-setting plastic parts. Maximum mold size is 42x36 in. The daylight between platen and head is 54 in. and maximum ram travel is 26 in. The upward acting hydraulic ram is fitted with a small internal booster ram, providing high speed closing up to 320 ipm, and automatic slowdown is provided prior to mold contact. The press is also equipped with automatic breathing or degassing cycle, and a Hydro-Power variable delivery radial, piston type hydraulic pump. The motor is 25 hp.

Plastic Molding Presses

NEW 200 and 300 ton models have been added to the line of heavy duty plunger presses for transfer and compression molding, manufactured by *F. J. Stokes Machine Co.*, 5904 Tabor Rd., Philadelphia. These models are designed particularly to handle high speed precision plunger molding of intricate work such as insert jobs and parts with thick or thin sections or projections. Forty-ton injection pressure is available on the smaller and 60-ton on the larger, with platen areas 26x23 in. and 36x28 in., respectively. Both feature a toggle lock that holds the mold shut during injection. Independent pressure control in both transfer and clamping cylinders is possible on both machines. This combined with a patented, bar-type controller is said to provide flexibility and simplify changes in the molding cycle.

Cylinder Block Drilling

TWO machines, a 7-station, 94-spindle, line process machine to drill, ream, chamfer and counterbore bottom face of cylinder blocks, and a 5-station, 74-spindle, line process hydraulic feed-type drilling

machine for drilling ends and the top surface of cylinder blocks, have recently been completed by *Le Maire Tool & Mfg. Co.*, 2657 S. Telegraph Rd., Dearborn, Mich. The 7-station machine has four operating stations and produces approximately 72 pieces per hr at 100 pct efficiency. Production on the 5-station machine with two operat-

ing stations is approximately 63 blocks per hr. Both machines are entirely automatic.

Special Tapping Machine

A MACHINE that taps 60 holes in an automatic transmission case at the rate of 65 pieces per hr has been developed by *Cross Co.*, Detroit 7. The work cycle is automatic and push-button controlled. An automatic shuttle carries the part from the first station, where 25 holes are tapped, to the second station, where 35 more holes are tapped, after which the part is returned for unloading. Each tapping spindle is equipped with an individual lead-screw feed, with a safety device to eliminate tap breakage if holes have not been drilled in

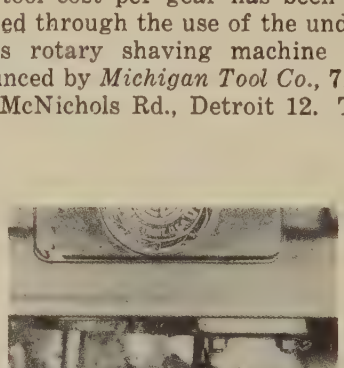
the previous operation. An automatic lubricating system provides a measured amount of oil with every cycle.

Drill Press Vises

DRILL press vises that are basic frames for jigs and fixtures for grinding, drilling and tapping operations feature push-lock, built-in parallels that are precision ground to allow work to rest parallel at all times. These vises, manufactured by *Hartman Mfg. Co.*, 1600 Junction Ave., Racine, Wis., are manually operated. A push on the center bar puts the jaw in position, another push on the locking lever locks the work securely. The Model 400 vise has an opening of 7 in. with a 6⅛ in. loading space; and the Model 600 opens 7⅞in., with a 7 in. loading space.

Underpass Shaving Machine

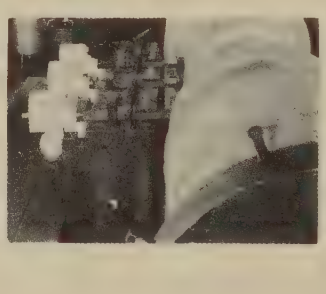
FINISHING time for helical shoulder gears for a ½-ton truck has been cut by more than 50 pct, floor-to-floor time, and overall tool cost per gear has been reduced through the use of the underpass rotary shaving machine announced by *Michigan Tool Co.*, 7171 E. McNichols Rd., Detroit 12. The



gear shown between the machine centers in the illustration has 17 teeth with a 34° left hand helix angle. Diametral pitch is 7.954; pressure angle is 20°; and pitch diameter is 2.137 in. The gears, of SAE 4027 steel, come to the shavers with between 0.006 and 0.008 in. stock, measured over pins, left for shaving the teeth. Machine operation is automatic except for loading.

Roll Lathe Feed

FOR uniform and exact rate of tool feed, Rollafeed, a portable unit designed for attachment to



tool rests of roll lathes, has been marketed by *United Engineering & Foundry Co.*, Pittsburgh 22. This accessory pushes the tool into the work in the same manner as done by the roll turner and utilizes same tools, wedges, and suppo Feeding mechanism is actuated air pulsations, which are contro by a headstock driven cam. sired rate of feed is selected fr a range of ten steps. Throwing automatic feed out of engagem permits the operator to feed tool by hand when approaching fi dimensions. Units may be used multiple and operated as closely 9 in. center dimensions.

Milling Cutters

INSERTED tooth milling cut bodies equipped for right ha cutting blades as standard, yet signed to take left hand cutters inserting a set of left hand st blades have been developed *Wendt-Sonis Co.*, Hannibal, The blade holding fixture of cutters is designed for quick a accurate blade setting, and bla are held securely in position. Ea

style cutter has the type of mou ing best suited for safety in ope tion and accuracy in machini The design uses C arbor mounti for 6-in. cutters and direct mou ing for 8-in. cutters.

Copper Welding Rod

FOR joining copper, Eutec 1805 FC is claimed to be t flowing, strong, and to have affinity for copper that insures u form deposits. It may be used w a torch adjusted for slight oxi ing flame, atomic hydrogen or t carbon arc. Flux-coated with improved coating for greater pillary action and speed of appli tion, the rod may also be used w Eutector Flux 1805 to reduce w ing heat and avoid distortion stress. This brazing type al made by *Eutectic Welding All Corp.*, 40 Worth St., New York has a tensile strength of 90,000

and 160 to 180 Bhn. It is available in ¼, 3/16, 3/32 and ⅛ in. flux coated sizes and in 1/16 in. bare.

Welding Shield

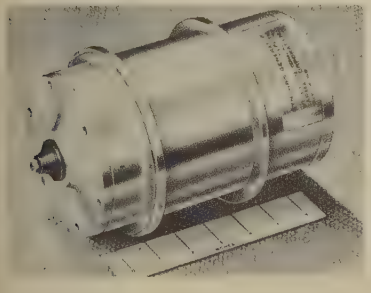
FOR operations where a welding helmet is not practical or for tack welding and setup work, a lightweight, seamless hand shield is announced by *American Optical Co.*, Southbridge, Mass. It is made in one piece from special fiber. The steel welding glass holder is insulated and rivetless. The fiber handle, 5½ in. long, is riveted to the body. Without the glass the shield weighs only 11 oz. Noviweld or Filterweld glass plates are available.

Welding Lenses

A HARD and durable alloy of high reflectivity is now being used for coating the improved Metalklad welding lens announced by *American Agile Corp.*, 5806 Hough Ave., Cleveland 3. These lenses, because of their high light reflection and absorption qualities, eliminate arc glare, increase welding efficiency from 15 to 50 pct, increase visibility 42 pct and afford 100 pct more eye protection, it is reported. The basic dark welding lens is clad with this coating on the outside surface, giving a hard, transparent, mirror-like surface which completely reflects ultraviolet and infrared rays of an electric arc.

Synchro Units

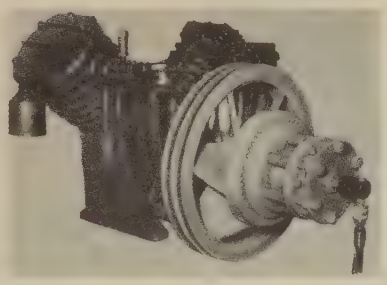
FOR electronic, electro-mechanical, and electro-hydraulic control systems and for remote control and



indicating purposes, a line of synchro units has been designed by *Arma Corp.*, 254 36th St., Brooklyn 32, N. Y. The line includes control transformers, motors, generators, differential motors and differential generators. Operation is from standard, single phase 115 v, 60 cycle lines. The secondaries are 90 v maximum, three wire systems. The output windings of the control transformers are scaled to a gradient of 1 v per deg F.

Air Compressor Clutch

AN automatic air compressor clutch developed by *Wichita Falls Foundry & Machine Co.*, Wichita Falls, Tex., requires no attention from the operator and starts and stops at any desired maximum and minimum pressure. It is intended for heavy duty use and employs six springs to provide automatic engagement. Air pressure acts on a diaphragm, when pressure operates the unloader, to disengage the clutch. The unit may be mounted with the air compressor at the outer end of the power unit output shaft and driven by a V-belt pulley. Friction lining is said to wear up to 14 in. before replacement is necessary.

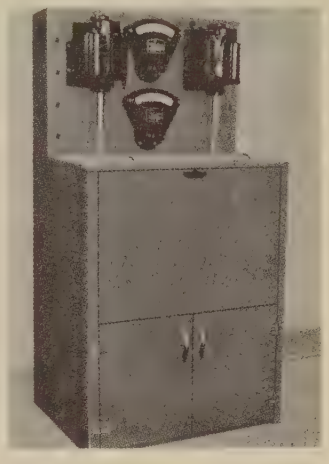


Single Cylinder Pump

A NEW and simplified single cylinder pump, Model S, for diesel engines in the 5 to 15 hp range has been announced by *Ex-Cell-O Corp.*, Detroit 32. The pump is used for small one and two-cylinder, high-speed diesel engines. It is available in a range of plunger diameters from ¼ to ⅜ in.

Liquid Immersion Test Unit

TESTING, calibrating and regulating thermometers, thermocouples, pyrometers, and other temperature indicating and control devices can be accomplished with a dual liquid immersion testing unit developed by *K & H Industrial Products, Inc.*, 459 Morgan Ave., Akron 11. This testing unit has twin tanks, each equipped with individual temperature controls and liquid agitators. The twin tanks facilitate double checking of each instrument being tested, and operate at a range of 70 to 700°F. Tanks hold approximately 4 gal of fluid and will accommodate thermocouples up to 17 in. long. Electric motors that power the agitators operate on 110 v ac, and heating elements on 220 v ac. Temperature controls permit instant setting of desired temperatures for test purposes.



Universal Testing Machine

FOR quality control, production testing, and for research work, an electronic, low capacity universal testing machine has been developed by *Tinius Olsen Testing Machine Co.*, 1042 Easton Rd., Willow Grove, Pa., under the trade name, Electromatic. By applying the loads electronically an infinite variety of positive tests can be run. The equipment consists of a weighing system for indicating and recording spread load ranges of 250 to 1, extension ranges of 200 to 1, and straining ranges of 400 to 1.

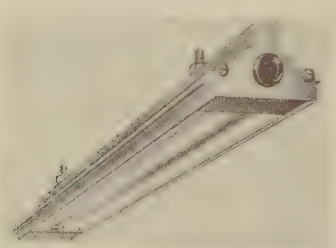
Electrostatic Voltmeter

A PORTABLE, electrostatic voltmeter designed to meet the need for a high-impedance, high-voltage instrument in laboratory and industrial testing, has been announced. Available in five ratings

of 40, 50, 60, 70, and 75 kv rms, the instrument is recommended for use in measuring applied voltage during dielectric test, to study electric phenomena, to determine peak voltage by the vacuum tube method, to measure exceptionally high voltage when used with a voltage divider, and to determine the peak voltage output of magnetos. This voltmeter is marketed by *General Electric Co.*, Schenectady 5, N. Y. The moving system consists of two fixed electrodes between two small metal spheres that revolve on a pivoted shaft on which are mounted aluminum damping vanes, a mirror, and a spring. The mirror reflects a beam of light onto the scale, indicating the position of the moving electrode. Housed in a cylindrical steel case 21½ in. in diam, it weighs about 50 lb. The high-voltage connector projects about 12 in. above the 35-in. high case.

Radiant Heaters

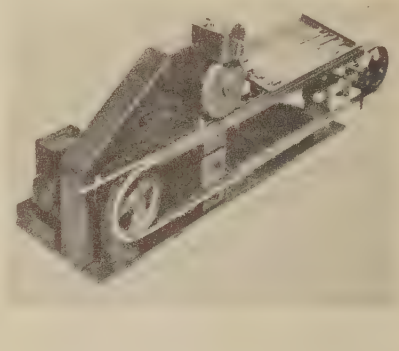
FOR drying, baking, preheating and dehydrating where a longer wave infrared heat source is desired, *Edwin L. Wiegand Co.*, 7500 Thomas Blvd., Pittsburgh 8, has announced all-metal, electric radiant heaters. High heat intensity results from utilizing almost the entire infrared band, which is claimed to result in a new and improved type of heating. Heating elements are mounted at the focus of a parabolic reflecting surface for



maximum heat radiation and uniform distribution over the surface to be heated. A negligible amount of visible light is produced from the tubular electric heating unit, operating at temperatures of 1000 to 1400°F. Wattage ratings are available to suit operating conditions. Glassless construction permits an unobstructed, unfiltered path of infrared radiation of the longer wage lengths. Heating elements of the same or different wattage can be changed on the job. Three standard body element lengths are 25, 31 and 47 in. with heated lengths of elements 17, 23 and 39 in. Standard height is 4 in.

Automatic Marking Machine

WELDING rods, solder bars, short-length tubing and similar ferrous and nonferrous prod-



ucts of ⅛ to 2 in. diam can be printed automatically with a new, motor-driven marking machine announced by *Pannier Corp.*, 206 Pannier Bldg., Pittsburgh 12. Uniform and irregular lengths from 2 to 24 in. can be printed continuously or intermittently as desired at 72 fpm. Powered by a ¼ hp motor, the machine is equipped with a quick-change printing wheel, a hopper feed, belt conveyer, automatic, interior-feed ink fountain, and adjustments for wear. The printing wheel and conveyer are synchronized.

Magnetic Sweeper

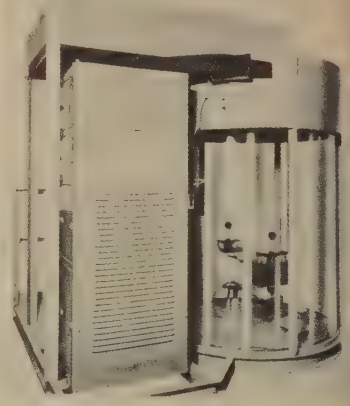
A PORTABLE sweeper known as the Magna-Sweep that has been developed for picking up iron or steel particles also reclaims ferrous scrap and is said to be capable of picking up 10 to 20 lb of turnings or 40 lb of plate in one load. The sweeper is recommended for use in machine shops, loading docks, parking lots, foundries and any installations where miscellaneous iron is encountered. The permanent, non-electric magnet makes the unit equally effective on wet or dry surfaces and the sweeper can be completely submerged. In operation, the magnet rests on a horizontal nonmagnetic wearing plate to which the iron and steel is attracted and firmly held. To clean, operator lifts the lever on the handle and the magnet is raised up and away from the wearing plate, allowing iron to drop off. Magna-Sweep sweepers are manufactured by *Dings Magnetic Separator Co.*, 4740 W. McGeogh Ave., Milwauk 14, and are available in two siz The A size is based on a 12 magnet and the B size on a 24 magnet.

Rubber-Cork Material

ELASTO-RIB, a new laminat rubber-cork material for lo cost, effective vibration and noi control, has been announced *Korfund Co., Inc.*, 48-15 32nd Pla Long Island City 1, N. Y. It composed of a layer of cork bond between two layers of deep-groove oil-resistant, synthetic rubber. T ribbed contour of the rubber i creases the isolation properties the material by providing great deflection and forms a non-sk contact with the floor, frequent eliminating the need for boltin machines to the floor. Elasto-R is available in 1-in. thick sheets u to 24x36 in. Recommended loadin is between 7 and 21 psi.

Crane Cab Cooling

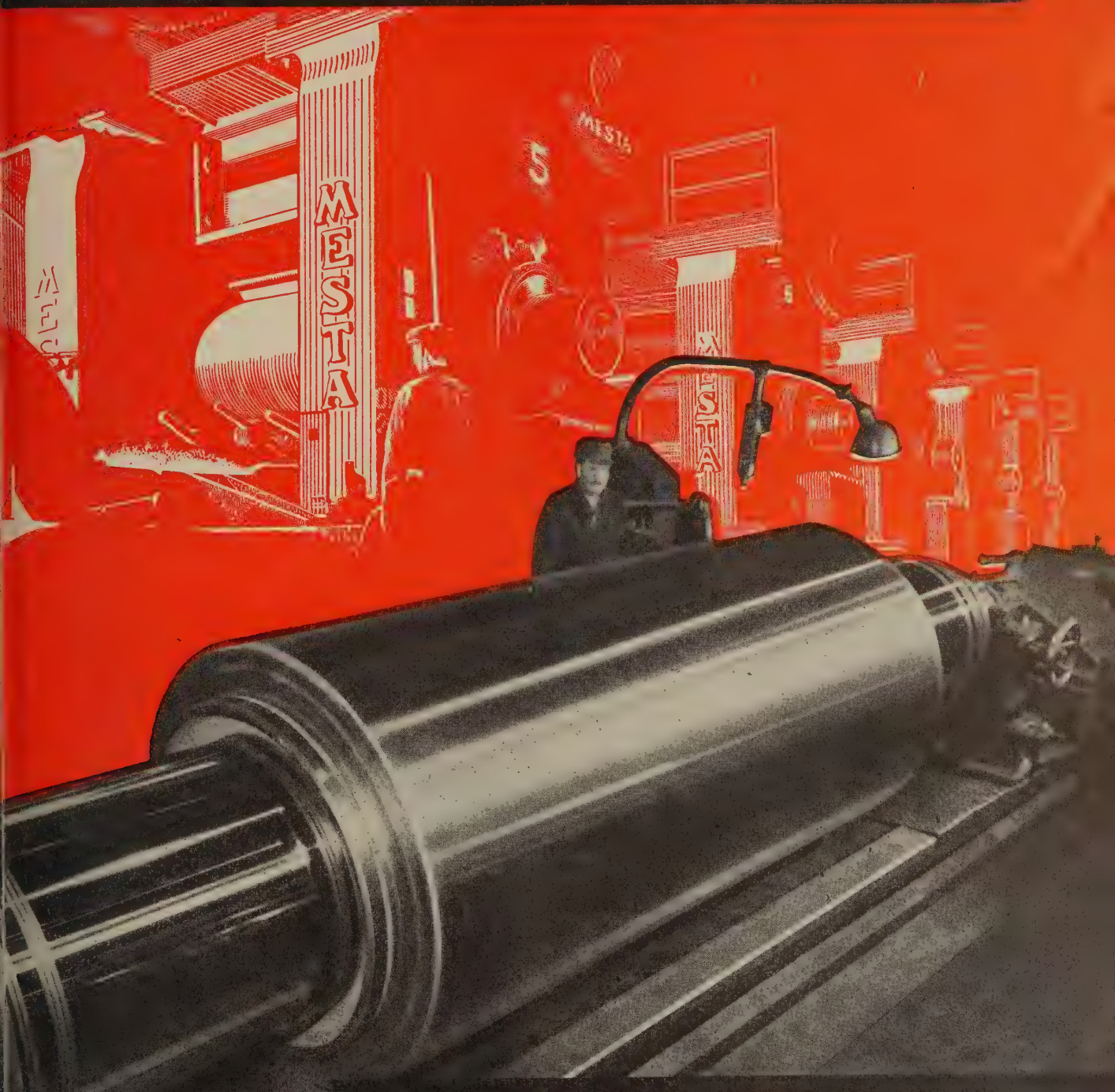
TROUBLE-FREE cooling crane cabs with low service r quirements is claimed for the Air Rectifier with air-cooled conden er, announced by *Lintern Corp.*,



Lincoln Ave., Berea, Ohio. It equipped with a screen-type, clea able filter for removing from th air delivered to the cab for ve tilation dirt particles as small four microns. The cooling equi ment can maintain the temperatu in a properly designed and ins lated cab of 200 cu ft capacity 85°F with an ambient temperatu as high as 170°F.

MESTA

HEAT TREATED SPECIAL ALLOY STEEL BACKING-UP ROLLS



Mesta 59" x 130" Heat Treated Special Alloy Steel Backing-Up Roll Being Finished in a 60" Mesta Heavy Duty Roll Grinder

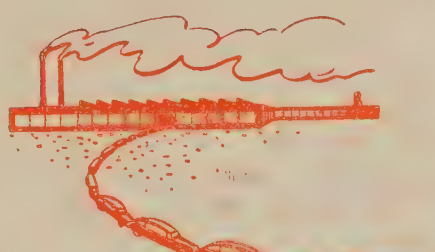
DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY · PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• Foundry strike sends auto builders to unfamiliar sources for castings . . . Fisher Body's model builders get university scholarships . . . Chevrolet-Atlanta turns out its millionth vehicle.



DETROIT—Automobile output rose slightly during the week ending Aug. 20, reaching 113,847 units, according to Ward's Automotive Reports. The revised figure for the previous week is 112,342.

Resumption of production at Packard after a one-week shutdown for lack of steel was offset by an estimated loss of 3000 units at International Harvester whose plants are closed by a UAW-CIO strike.

Nash is still down for a model changeover and Hudson was idle for the third consecutive week because of the strike at Campbell, Wyant & Cannon foundry in Muskegon.

According to informed sources, the CWC labor dispute is badly hung on the issue of a closed shop. Federal negotiators who tried to settle the strike have thrown in the sponge.

Meanwhile, several auto producers have had a hectic time trying to rearrange their supply lines. A Chrysler division, for example, has had to switch from a cast camshaft to a forged shaft which will be made in Detroit. Camshafts for another Chrysler division are being made by CWC supervision which is operating the Muskegon foundry on a limited basis during the strike. Ford is making Lincoln castings, usually supplied by CWC, at the Rouge.

It is reported that patterns for two independent auto producers have been removed from the CWC plant at Muskegon and attempts are being made to pour cylinder blocks and camshafts at other foundries. Castings, it is reported, have been furnished by foundries as far distant as Virginia. Other former CWC business has been placed in an Illinois foundry.

Some sources here are speculating as to whether or not Muskegon will suffer a permanent loss of business as a result of the work stoppage which is now going into its eighth week. Observers here have pointed out the similarity between the issues involved in the CWC strike and the newspaper dispute in Chicago. The newspaper controversy is now almost a year old.

* * *

BASED on a study of the model cars entered in the 1948 competition for boys of the Fisher Body Craftsman's Guild, the drivers of tomorrow's cars want more streamling, more vision, greater driver comfort and improved safety.

Automobile designers who have seen the exhibit of model cars in Detroit agree that the style trend as seen by American youth closely parallels the styling as it actually exists in the motor industry.

A study of the Craftsman's Guild models shows a strong tendency to eliminate all protuberances from the car body. The boys want to make cars more integrated mechanisms. Special emphasis is placed on improvements on safety and vision.

The models are designed for greater ease in entering. Windows are generally larger than the present models. The model cars are wider than most models on the highway today, affording a better seating arrangement for the passengers.

Another noticeable trend is the elimination of fenders and the shortening of hoods. The gradual disappearance of hoods has aided in increasing vision, accordin automobile stylists. As the dr looks toward the road he is affo a much better view. (Some car ducers, however, still insist large impressive hood arra ment.) Another step in this d tion is moving the passenger department toward the front o car, it is pointed out.

It is interesting to note nearly one third of the models mitted in the Guild's 1948 com tion were designed for engin the-rear. One explanation is boys entering the contest feel rear engine principle is more ern. "Actually, most of the have had little apparent reason the rear engine design, bec they could place the engine in front of their models as well out changing their design," acc ing to Frank Hershey, chief o General Motors styling section' perimental design studio and of the judges in the Guild con

The model cars are being ju by states and regions at two j ing centers. One set of judge deliberating at the Macy & store in New York City; the o is at the General Motors E showroom in Detroit.

Forty three regional win have been announced. These attended the national conventio the Guild in Detroit on Aug. 2 Eight of the winners were awa university scholarships.

Some observers have asked designers if they are able to any ideas from the designs mitted by the boys in the con With many designs on their d ing boards 20 years ahead of times, the experts naturally find work of the boys falls short of fessional requirements. How they do find the sleek little m submitted by the boys are st lating. One conclusion that ca drawn is that, generally speal the youth of the nation is follo the style pattern already under among the automobile compan

* * *

IF you are one of those keen servers who thinks he has more new Cadillacs in W County this year than ever be

you're probably right. For the third time this year Cadillac Div. of General Motors has produced more cars in a given month than it did in 1941. Through July, 1948, Cadillac has built 33,832 cars. Nevertheless, orders are at an all-time peak of 113,345, according to John F. Gordon, general manager. Meanwhile, Cadillac engineers are working intensively on a new powerplant to be introduced during October. The new engine is expected to have the highest compression ratio in the industry.

* * *

To overcome cable limitations in rear engine vehicles, marine craft and motors for industrial engines where the distance from the dash unit to the engine connection is too long for satisfactory flexible shaft use, AC division of General Motors is building electrical speedometers and tachometers. The speed recording instruments operate on the same principle as the regular speedometers except that they are electrically driven.

The devices consist of a receiving unit mounted on the dash and a sending unit mounted near the transmission; these units are connected by a four-wire conductor cable.

The receiving unit has a regular speedometer mechanism and a "step-by-step" motor attached directly to its rotor shaft. This unit consists of a magnet mounted on the speedometer rotor and four coils equally spaced around the magnet and supported by the speedometer case.

The sending unit is essentially a commutator which distributes the electric current into a four-conductor cable to the four coils of the step motor. The coils are magnetized in rotation, pulling the magnet in line with the magnetic field. For each revolution of the sender, the shaft of the receiver makes a single revolution. The faster the sender is driven, the greater the speed indication shown on the receiver unit.

AC speedometers measure the speed of the vehicle in miles per hr and mileage traveled. The tachometer measures the number of engine revolutions per minute and also records the number of engine hours of operation.

* * *

THE growing importance of automobile assemblies at points outside Detroit is illustrated by the fact that the Chevrolet-Atlanta Div. early in September turned out its millionth vehicle. Many Detroiters are not aware of the fact that Chevrolet and Fisher Body operate a joint assembly plant at Atlanta and have been doing so since 1927.

Ground for the Chevrolet-Atlanta unit was broken in the fall of 1927. A little more than 4 months later the first unit was completed. A total of 38,246 units were assembled during the remainder of that year.

The present plant occupies 30.5 acres and has a total floor space of 360,000 sq ft. Current employment is 1450. The present plant has a capacity of 30 passenger cars and 15 trucks per hour. There are more than 10,000 ft of overhead conveyers and 2200 ft of floor conveyers.

The Chevrolet-Atlanta plant is one of ten Chevrolet assembly units located throughout the country. The Chevrolet organization now includes 25 plants located in 20 cities. In addition to the ten assembly units, 12 plants fabricate materials for assembly operations; two produce service replacement parts and one is devoted exclusively to the export-boxing business.

The adjoining Fisher Body-Atlanta unit now comprises 200,000 sq ft. The main assembly line has a floor-type conveyer pulled by a chain 9046 ft in length. Overhead monorail conveyers for handling doors, cushions and trim materials are 640 ft long. At the present time 540 workers are employed in the plant.

Auto Company Builds Body Stamping Facilities

Toledo

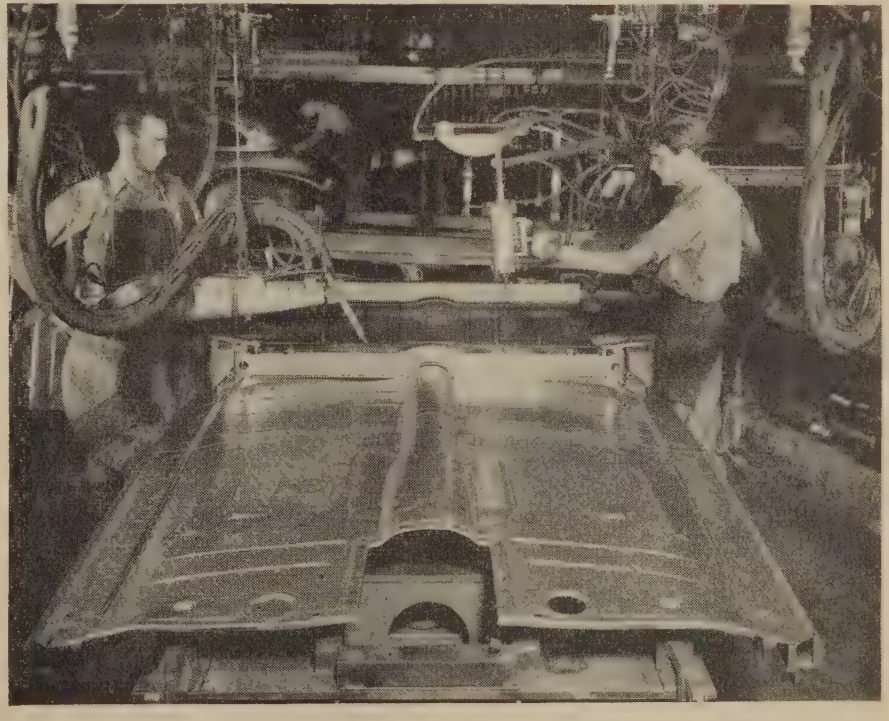
• • • **Willys-Overland** Motor Co. is now stamping the bodies for their Jeepster and automotive manufacturer's truck in their own $5 million body stamping shop, according to William E. Paris, vice-president in charge of manufacturing.

The new shop is a part of the company's $21 million expansion program. It completes this phase of their new production pattern.

Formerly all body stampings were purchased from various suppliers. Now, 600 bodies can be stamped in the shop.

In commenting on the new shop, Mr. Paris said: "Ordinarily a press or line of presses is set up to stamp out a month's supply of one particular body part. This supply is stored for future use on the body assembly line. But because of the present scarcity of steel we are forced to reset or change dies on the presses as often as four times a month in order to have available all body parts on our assembly line."

ONLY THE BEGINNING: One of the preliminary jobs in an auto assembly plant is welding the underbody sections together. Below, the floor pan for a Chevrolet is being welded at Chevrolet's assembly plant at Atlanta. From this basic structure, another Fisher body will end up in a completed automobile.



Washington . . .

EUGENE J. HARDY

• FTC order strikes at freight equalization . . . Industry attorneys say precedent is set for steel decision . . . FTC counsel claims individual transactions not illegal.

WASHINGTON — Relatively inactive in recent weeks the Federal Trade Commission's case against the steel industry is again calling for close attention on the part of steel industry attorneys. Recently, the commission filed a cease and desist order which among other things prohibits the crown (bottle cap) industry and its trade association from using a method of equalizing freight which results in identical delivered prices.

In view of the circumstances surrounding the issuance of this order, as well as its language, some industry attorneys feel that the moderate view within the commission, fostered by Lynn Paulson, FTC counsel in the steel case, has been shelved by a majority of the five-man commission. It will be remembered that Mr. Paulson has recommended to the commission a cease and desist order which he says would permit the steel industry to absorb freight on an individual basis to meet competition, but not in any "systematic" pattern.

It is generally conceded that the word "systematic" is the crux of this problem. Individual freight absorption would be confusion compounded according to some steel sources. B. F. Fairless, president, U. S. Steel Corp., in announcing the switch to f.o.b. mill pricing stated "it is unrealistic to suppose that these subsidiaries (U. S. Steel's producing subsidiaries) can market satisfactorily more than 50,000 tons of finished steel each day throughout the year without the use of a *standard merchandising method,* fully understood by both buyer and seller."

The crown industry operates on an f.o.b. factory basis with freight equalization so that no customer pays more freight than that which would accrue on a shipment to him from the manufacturer whose factory is nearest to him.

THE commission ordered this industry to cease "quoting or selling at prices calculated in accordance with any freight-equalization plan which results in uniform delivered prices at any given destination, or which deprives purchasers of an opportunity to obtain some advantage in price or more favorable terms or conditions from one of the producers than from another."

Thus far, the case appears to be a relatively simple affair—the commission forging ahead in its effort to outlaw all delivered price systems. However, there are several unusual twists to this case, which covered a period of about 7 years from the time the complaint was issued until the cease and desist order was filed.

After hearing volumes of evidence the FTC trial examiner, W. W. Sheppard, last fall recommended to the commission that the complaint be dismissed. He backed up his recommendation with respect to every charge made in the original complaint and regarding freight equalization found that this practice was not part of any conspiracy, a view which the commission ignored in completely overruling the examiner.

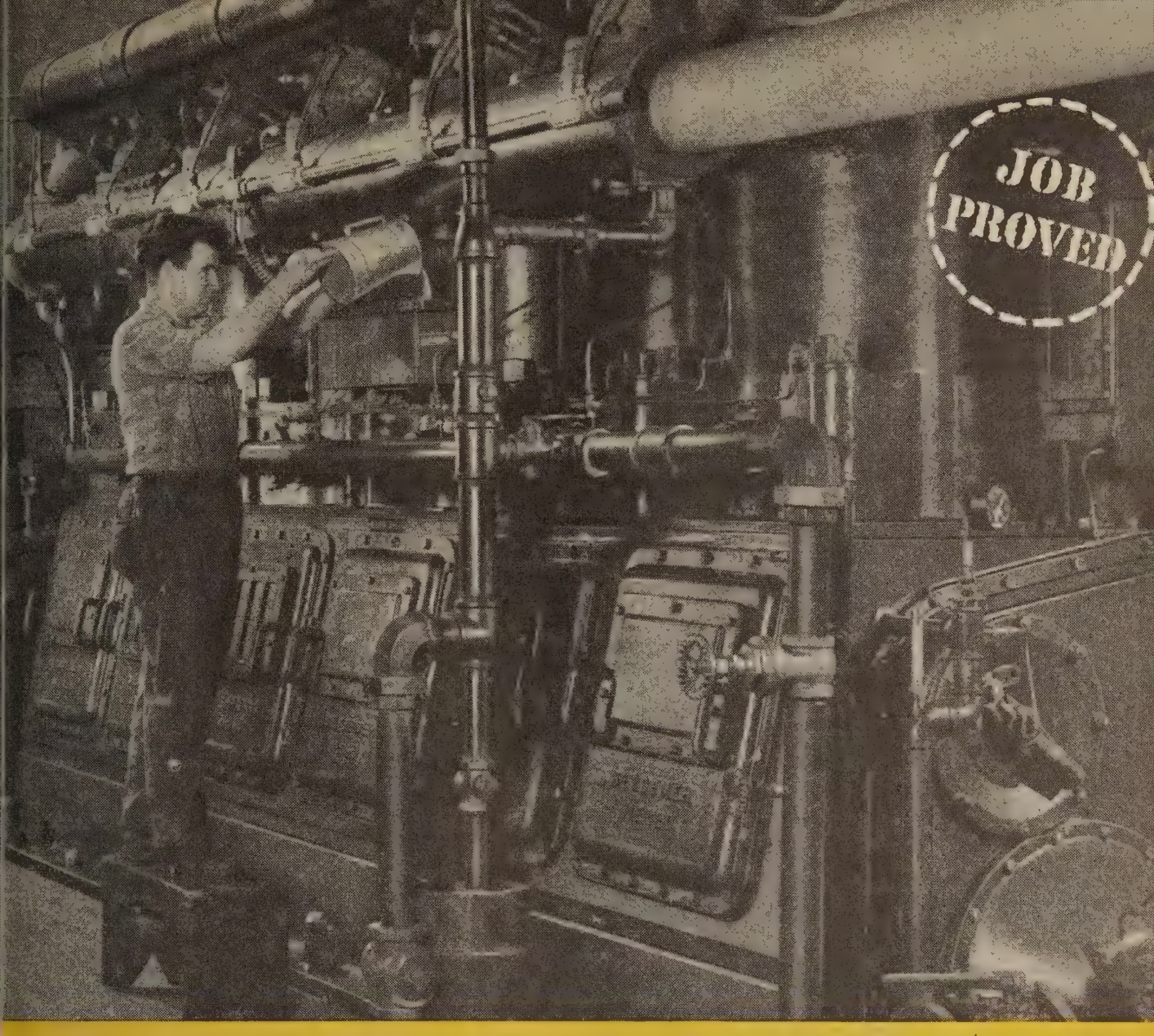
While it was unusual for the commission to overrule the FTC trial examiner it was equally unusual for the examiner to issue a report favorable to the industry. There seems to be little doubt that this favorable report can be traced directly to the Administrative Procedures Act. Prior to the passage of this act, examiner's reports were confidential and were made available only to commission and industry attorneys. They were not a part of the permanent record of the case. Generally, trial examiners felt that they were a part of the commission and regularly upheld the commission line.

THE Administrative Procedure Act gave the trial examiner considerably more independence and the favorable report in the crown case was a probable result. The commission in completely overruling the examiner's findings and recommendations may be troubled by his report if this case reaches the courts, since the report is now a part of the record.

Industry attorneys view the crown case as a definite indication that the commission is out to do away with delivered price systems and any form of freight equalization or absorption, in other words a direct slap in the face to those in the commission who favor a moderate settlement in the steel case.

Lynn Paulson, mainstay of the moderate group, disagrees with this viewpoint. He maintains that (1) the crown case was not as important as the cement or steel cases, and consequently cannot be viewed as a policy-setting decision and (2) the commission found a common plan in this industry (EDITOR'S NOTE: the examiner did not) not independent freight equalization. Mr. Paulson still feels that if the steel industry will get away from any common course of action the commission will not be inclined to get tough when it finally gets around to issuing a cease and desist order.

The completely divergent findings of the trial examiner and the commission regarding freight equalization in the crown case make interesting reading in view of the current attempts to work out some



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method of meeting competition in distant steel markets.

THE examiner found that the industry used a method of f.o.b. factory sales, with equalization of freight to meet competition—the moderates in the commission believe that the steel industry should be permitted to absorb freight in individual cases to meet competition.

He further found that "the equalization plan included so-called 'free points,' which were places where crowns and discs are manufactured, and where individual respondent-members encountered competition with other manufacturers of crowns and discs. It appears from the evidence that this practice was of long duration in the industry and was instituted as far back as 1921, 4 years before the respondent association was formed. It is therefore held that this practice of respondents of meeting competition at 'free points' was not evidence of conspiracy, nor did it result in suppressing or restraining competition at such points but allowed each respondent-member to meet competition at said 'free points,' where there existed a competitor in the manufacture of crowns or discs."

Then citing an economic example of what might happen if this system of freight equalization is outlawed, the examiner might well have been talking about steel, according to some members of the industry when he said: "In other words, if each mill referred to confines its sales to its immediate territory, each would have a monopoly in its own area; if each of them wished to extend its business into the territory of the other, each would have to equalize freight when going into the territory of a competitor, at any of the points at which there was located a competing manufacturing plant."

TO back up this finding, the examiner cites the Staley case in which the Supreme Court ruled that there was no absolute ban on freight absorption being handed down.

The commission's order was in agreement with the examiner regarding the method of sales, the existence of "free points," and the utilization of freight equalization, but beyond this the commissioners struck out their own and overruled the examiner.

Pointing out that the method of pricing in the crown industry resulted in uniform delivered pric the commission made much of contention that each member of industry "knows that its b prices and its terms and conditi of sale for crowns are the same those of other respondent ma facturers.

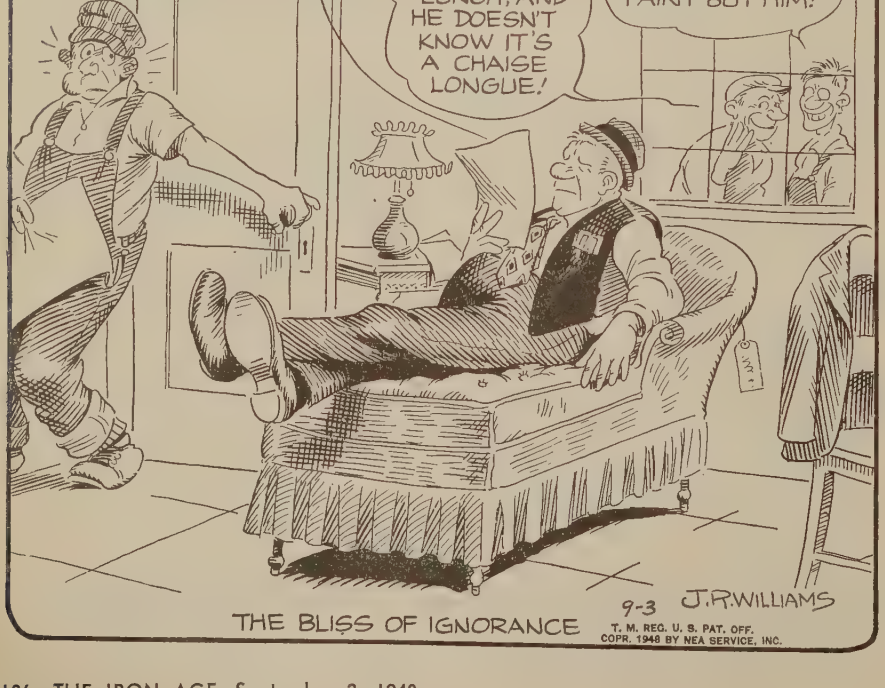
"In addition to knowledge of base prices of all of the other spondent manufacturers, each s respondent manufacturer kn that every other respondent ma facturer uses the plan of equa ing freight with the location of manufacturer nearest the purch er. It knows, too, that by the of this plan each will be able deliver its products to every p chaser at any given destination exactly the same delivered price others using the plan, and thus users of the plan will be able present to a prospective purcha a condition of matched prices which such purchaser is depri of any choice on the basis of pr

"THIS the respondents do deny, but they contend that so matching prices with each ot at any given destination they merely 'meeting competition.' order to produce such matc prices sellers of crowns must, numerous destinations, accept receipts for their products vary in amount according to the frei absorbed as a result of the clo proximity to the purchaser of so other seller. Each participant the use of the plan consciously tends that no attempt be made exclude any seller of crowns fr the natural freight-advantage t ritory of another, and by the of the plan invites other sellers share the available business in natural market in return for s ilar treatment for itself in trade territories of all other p ticipating sellers.

"When, as in this industry, price of the seller nearest the p chaser is always accepted by ot sellers and there is no bargain on the basis between buyers a sellers, fundamental requireme of a true competitive market lacking and prices are not the sult of market action in the e nomic sense, but are mere expr sions of an artificial and mono listic price structure."

The language used by the co mission is suspiciously coincide with opinions expressed within commission regarding the steel dustry during the past two decad

THE BULL OF THE WOODS — BY J. R. WILLIAMS



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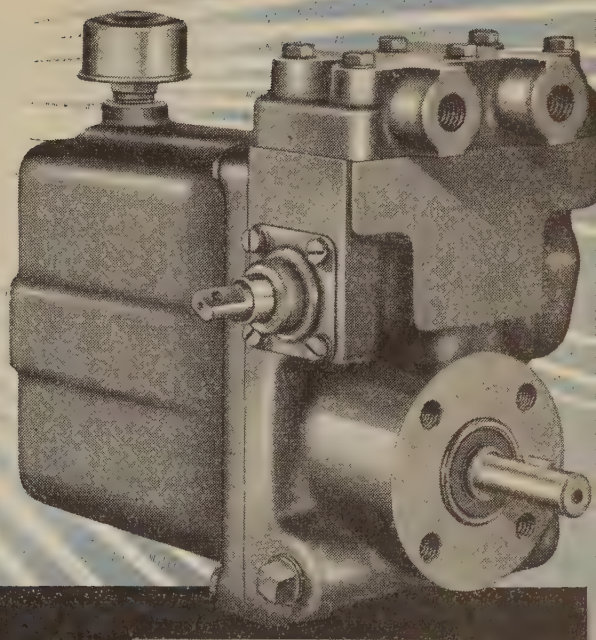

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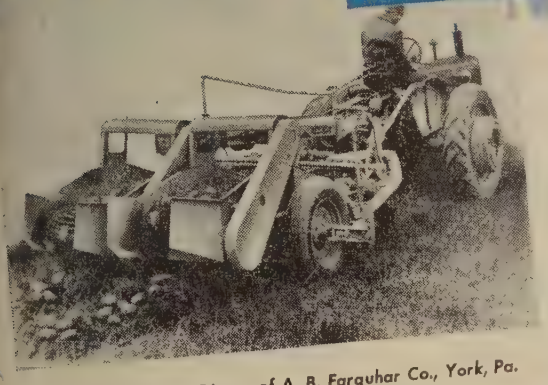
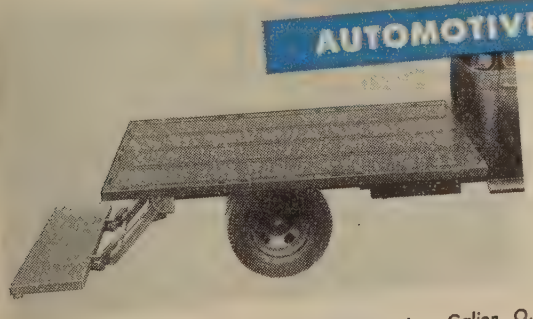


"Iron Age" Potato Digger of A. B. Farquhar Co., York, Pa.

AUTOMOTIVE



"Hydraul-Lift" Tail Gate of Cemco Industries, Inc., Galion, O.

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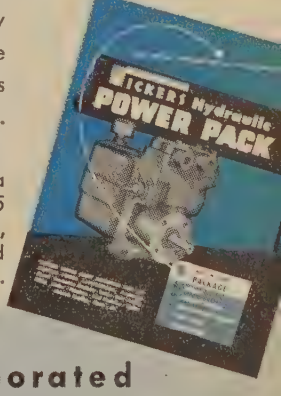

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West Coast . . .

ROBERT T. REINHARDT

• Another Marshall may have started another "rush" in California . . . Scrap tightening on the Coast . . . U. S. Steel Corp. tangles again with Utah tax commission.

LOS ANGELES — There's a ghost of a chance—even a possibility—that the name Marshall once again will go down in California history.

A few months more than 100 years after John Marshall picked a small gold nugget from a flume at Sutter's saw mill near Coloma,, Albert B. Marshall picked up samples of rock from his 275-acre foothill ranch near Beaumont, about 65 miles northeast of Los Angeles, in the hope he had found gold or silver. To round out the assay the samples were gone over with a Geiger counter and, according to the best information available, sent the gage to the 58 mark which is 18 points above the minimum radioactivity requirements set by the government.

Hurrying back to his ranch he quickly tore down a "for sale" sign which had offered the property for $21,000, because if this deposit of uranium-trioxide proved only moderately abundant, Mr. Marshall is in line for the $10,000 bonus offered to anyone who finds this ore in sizable amounts. In addition he can sell all that he can take out at approximately $3.50 per lb.

If this "find" proves of commercial value it is probable that San Bernardino and other mountains in this area will be literally covered with prospectors carrying Geiger counters instead of gold pans and the stampede will probably make the gold rush of 1948 fade into insignificance by comparison.

So far as is known to the U. S. Bureau of Mines this is the first report of the finding of uranium-trioxide with such high radioactivity in the state. A recent strike of this material has been reported in British Columbia near Gunn Lake about 115 miles north of Vancouver. That find, however, was not so unexpected as the local discovery, since the Pacific Northwest has long been noted for its radioactive minerals.

At the moment local industrialists are more concerned with the prosaic subject of scrap metal than with this radioactive ore. There is growing concern over apparently increasing scarcity of scrap in this area despite continuous shipbreaking activity. With the end of this source in sight there is some consternation being evidenced about future supply. Shipbreaking has provided a large portion of the 1,800,000 tons of scrap used annually in coastal areas.

The scrap which is reported as still being plentiful in the Pacific Islands is being shipped primarily to the East Coast at the present time because shipping costs for the additional mileage to that area are low when compared to the higher prices being paid at Atlantic ports. Some of the more optimistic buyers in this area believe that when scrap is shipped from Europe to the Atlantic Coast that action may force some of the Pacific Island metal to the West Coast, but there is a feeling that if this is done, prices for the scarce material will be raised first.

WHILE principal grades of steel scrap have gone up $2.50 a ton in the last 2 months the supply has not materially improved. Foundries are particularly hard hit as the cost of cupola cast apparently fluctuates with every sale and prices have been quoted all the way from $45 to $58 a ton in this area.

"I've never seen anything quite so chaotic in all my years in the business," commented Clyde Hoping, president of the Alhambra Foundry in discussing the cupola cast market.

"Every day or so there are truck stopping here trying to sell ca scrap. The man hardest hit final has to buy at one of the high fluctuating prices. Seemingly scor of small dealers have started sellin cupola cast," he reported.

Mr. Hopping said that areas as far away as Nevada and Wyomin had been combed for scrap to su ply local foundries. He saw son possible seasonal relief this winte however, when southern Arizon and the Imperial Valley cool c sufficiently to encourage new scra hunts which might aid small fou dries.

An official of the Kaiser plant Fontana indicated that the pla there expects to begin using co siderably more ore this fall aft its blast furnace is restored to o such aseration, but other produce Bethlehem, Columbia, Judson an Pacific States will continue to dra heavily on the scrap market as th do not have their own sources hot metal nor pig.

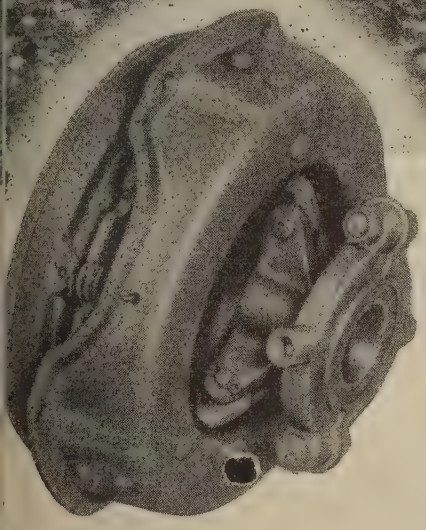
The scrap pinch is a coastwi condition, although the produce here and in Seattle seem hard pinched than in central Californi

In Seattle, cupola No. 1 is no selling between $40 and $45 p ton; electric furnace somewhere b tween $36.50 and $40 per ton; whi No. 1 and No. 2 heavy melting a holding at $26 per ton.

Buyers are reported as payin $25 to $26 per gross ton for No. in the Spokane, Wash., and Por land, Ore., areas.

Buyers in the Northwest wh have been getting some materi from Alaska Junk Co., which importing scrap from Alaska, a watching developments on the w terfront with more than usual i terest. This company has approx mately 2000 tons of scrap enrou from the north and a waterfro tie-up would seal this off. Alread this company has brought in a proximately 18,000 tons of scra from Alaska, but this importatio will cease after mid-Septembe when freight rates are increase

FIRST USER... Still a User



Top—The Twin City 12-20 tractor, one of the first two engineered tractors on the American market, appeared in 1918.

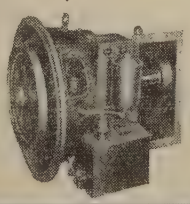
Center—Minneapolis-Moline Power Implement Company's Universal R tractor and cultivator.

Below—Twin Disc Farm Tractor Clutch.

For other examples of power transmission *then* and *now*, write for the "30th Anniversary Issue" of *Production Road*.

Thirty years ago this month the Twin Disc Clutch Company was incorporated to produce *better* clutches for farm tractors. The first units were used in equipment of the Minneapolis Steel and Machinery Company—now Minneapolis-Moline Power Implement Company. Throughout three decades, Minneapolis-Moline has continued to use Twin Disc units in its farm machinery. During these thirty years, leading manufacturers of equipment for the logging, petroleum, construction, marine, locomotive, and machine tool industries have also found Twin Disc Clutches and Hydraulic Drives the most efficient power transmission units. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

Power Take-off



Hydraulic Torque Converter

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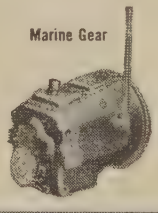
Machine Tool Clutch

Heavy Duty Clutch



Marine Gear

JUDGE TWIN DISC BY THE COMPANIES IT KEEPS

but possibly may be renewed in the spring.

SEATTLE—Encouraging to labor leaders who have been seeking additional work for local shipyards is the $600,000 contract awarded to the Todd Shipyard Corp. for conversion of a former Navy transport, the Hotspur of the C-2 type, one of ten to be converted on the West Coast for the freight fleet of Waterman Steamship Corp. Another of the ships, the Young America is scheduled to be sent up from Oakland to the Everett-Pacific yard at Everett, Wash., for conversion.

Contracts for two other vessels in Seattle, one in Everett and five in San Francisco, have not as yet been awarded. Hope is high here that several more of these vessels will be converted locally as work had been running low and if no more LST's are to be broken up for scrap after the first of the year, it will mean layoff for large numbers of men. Recent increased activity at Bremerton Naval Yard has taken up some of the slack. It is estimated that conversion on the C-2 ships will not take more than 90 days.

Handling freight shipments between this port and Alaska by barge continues to be a flourishing venture. The Portland Tug & Barge Co. has been authorized to engage in operations along the Pacific Coast and nine ocean-going tugs and several barges will be put into operation in coastal trade immediately. The Alaska trade gave this company, operating under the name of Ocean Tow, a start.

Alaska Freight Express recently dispatched one of its steel barges towed by the tug Portugbar to Alaska with a capacity cargo of construction supplies and general freight.

Included in the cargo were four steel bridge column-sections, two 46 ft long and weighing 3 tons each and two 57 ft long and weighing 4 tons each. These units will be erected as one of the towers for a railroad bridge support 2 miles north of Mt. McKinley Park on the Alaska R.R. Structural steel was fabricated by the Puget Sound Bridge & Dredging Co. of Seattle for the Alton V. Phillips Co.

This bridge, 346 ft long is one of the six being constructed for the Alaska R.R. between Mt. McKinley Park and Healy, Alaska, on a joint venture contract between Alton V. Phillips and Cascade Contractors, Inc., for $450,000.

OTHER cargo included eight railroad cars of cement for the M. P. Munter Co. to be used in construction of 25 bridges on a highway between Turnagain Arm and Portage north of Seward. Munter and Phillips have a subcontract from Lytle-Green, prime contractors for the new roadway which will link the Kenai peninsula with Anchorage. These structures are a combination of concrete, steel and wood piling and will involve an expenditure of approximately $1,700,000.

Boeing Airplane Co., which has been struggling along under strike conditions since last April, has run into another bottleneck in the form of aluminum extrusions. With the heavy backlog of orders from the Air Force, Boeing might be expected to get government aid in supplying its needs, but thus far there is no indication of succor from that direction. Representatives of Alcoa blame their curtailment of shipments on a shortage of aluminum pig and heavy national demand.

Some ray of hope came with the announcement that the Bonneville Power Administration had extended additional power to Alcoa, Reynolds Metals Co. and the Permanente Metals Co., which will permit an increase in the production of aluminum pig by about 3000 tons per month. However, there is a likelihood of this extra power being curtailed after Sept. 1, when water conditions become less favorable.

* * *

SALT LAKE CITY—U. S. Steel Corp. subsidiaries are apparently headed for the Utah Supreme Court with a second case arising out of disagreements with the state tax commission. Already in the court is a case involving the imposition of the 2 pct use tax on the purchase of the Geneva plant from the government.

Last week the commission ruled that the assessment against Columbia Iron Mining Co. would be based on what the commission determines to be the actual value of the ore mined rather than on the price paid for the ore under contract.

Utah's mine tax law (written originally for nonferrous metals but now being applied to iron ore) imposes a 1 pct occupation tax on gross and fixes valuation for erty tax levies on a basis of a acreage charge plus 2 pct proceeds. Ordinarily both gro net are determined by actual to smelters. But because th mining company sells to Gen cost plus per ton, and becau companies are subsidiaries same corporation, the comm ignored the contractual price of the ore and gave it a of $1.55 per ton (the price p Kaiser interests to the Exc mine). The effect was to in the mine occupation tax from 759 to $28,433 and boost the ation (against which propert ies are applied) from $604,2 $1,649,133.

The reasoning of the tax mission was that the contra tween Columbia Iron Minin and Geneva is an intracon transaction and therefore do represent actual selling value ore. The Kaiser price was out as the only arms-length action in the state which doe resent selling value.

Columbia Iron Mining Co., concerned over the principle the money involved, has take position that the commission h authority to go into the re value of ores and is underta in this instance, to amend a ta by an administrative ruling. company further maintains th contract with Geneva is bon (1) because it was originall tered into between the mining pany and the government an because Columbia is bound by tract to sell iron ore to Kaise his Ironton blast furnace a same price it charges Geneva. government wrote this pro into the Geneva sale contra assure the purchaser of the su Ironton furnace an ore su Kaiser has not called upon C bia for ore but may do so 1961.

The commission likewise the value of the ore mined by rado Fuel & Iron Co. for its use from a reported $1 per t $1.65—the extra 10¢ being fied on the grounds that its or richer than that sold to Kais the Excelsior mine.

No. 3 blast furnace at G Steel plant is down for repair will not get back into produ for about 4 weeks. Because o low pig iron stocks, two hearths will remain closed unti blast furnace is blown in aga

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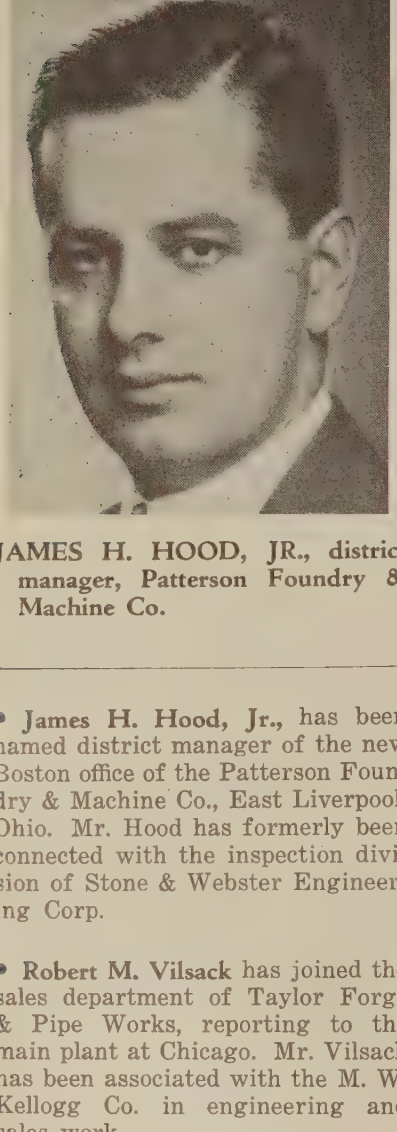


JAMES H. HOOD, JR., district manager, Patterson Foundry & Machine Co.

• **James H. Hood, Jr.,** has been named district manager of the new Boston office of the Patterson Foundry & Machine Co., East Liverpool, Ohio. Mr. Hood has formerly been connected with the inspection division of Stone & Webster Engineering Corp.

• **Robert M. Vilsack** has joined the sales department of Taylor Forge & Pipe Works, reporting to the main plant at Chicago. Mr. Vilsack has been associated with the M. W. Kellogg Co. in engineering and sales work.

• **L. E. Loveland** has been named Great Lakes district manager for Hotpoint, Inc., with headquarters in Cleveland. For many years Mr. Loveland has been associated with Eureka Williams Corp. as regional manager, and more recently as assistant sales manager. Mr. Loveland succeeds **Walter BonDurant,** who resigned to enter private business.

• **Theodore A. Siedle** has been appointed to the industrial relations staff of Dravo Corp., Pittsburgh, where he will head and coordinate management development training and educational activities throughout the corporation and its subsidiaries. Formerly on the training staff of the Aluminum Co. of America, Mr. Siedle, prior to the war, was dean of instruction at State Teachers College, California, Pa.

o o o

• **W. V. Garfield** has been appointed district sales engineer covering Connecticut and western Massachusetts for the Butterfield Div., Union Twist Drill Co., Derby Line, Vermont, with his headquarters in Naugatuck, Conn. Mr. Garfield has formerly been associated with Scovill Mfg. Co. and Darra-James Mill Supply Co.

• **David K. Miller** has been named Connecticut representative for Pratt & Inman steel warehouse, Worcester. Mr. Miller has formerly been sales representative for Crucible Steel Co. of America.

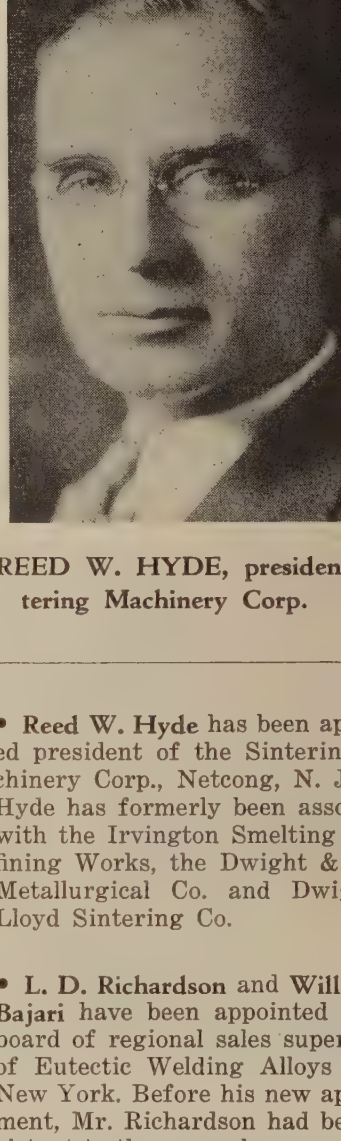
• **Robert P. Bremner** has been appointed mining engineer for the Youngstown Sheet & Tube Co., Youngstown. Mr. Bremner has been associated for the past 11 years with Pickands, Mather & Co.

• **M. K. Schnurr** has been elected president, treasurer and a director of Stainless Products, Inc., Elizabeth, N. J. **P. F. McEvoy** and **H. F. Wyman** have been named vice-presidents and directors of the organization.

• **Alexander Zekany** has been appointed sales metallurgist, American Cladmetals Co., Carnegie, Pa. Mr. Zakany has formerly been associated with National Tube Co.

• **Lewis W. Metzger,** vice-president of the Baldwin Locomotive Works, Philadelphia, has been made executive assistant to the executive vice-president, to assist in all phases of Baldwin's operating activities. **James R. Weaver** has been appointed manager of manufacturing, Eddystone Div., and **John S. Newton,** manager of engineering of that division. Both Mr. Weaver and Mr. Newton come to Baldwin from the Westinghouse Electric Corp.

• **J. P. Bankson** has been named assistant to the vice-president of Harbison-Walker Refractories Co., Pittsburgh. Mr. Bankson has been associated with that company since 1930 when he joined the Cleveland office as a salesman. In 1935 he was transferred to the Pittsburgh headquarters as district sales manager. He has served in that capacity until his present appointment.



REED W. HYDE, presiden tering Machinery Corp.

• **Reed W. Hyde** has been ap ed president of the Sinterin chinery Corp., Netcong, N. J Hyde has formerly been asso with the Irvington Smelting fining Works, the Dwight & Metallurgical Co. and Dwi Lloyd Sintering Co.

• **L. D. Richardson** and **Will Bajari** have been appointed board of regional sales super of Eutectic Welding Alloys New York. Before his new ap ment, Mr. Richardson had be sistant to the general manage Bajari served as a field ma

• **Charles F. Pendlebury,** wh been secretary and assistant urer of Veeder-Root, Inc., Ha since 1942, has been elected urer, succeeding **Charles G.** treasurer, assistant secretary director of the corporation, w resigned. Mr. Allyn has been ciated with the company sinc and has served as treasure director since 1932. Mr. P bury joined the company in in 1923. **Andrew J. Rebma** sistant secretary, has been assistant treasurer. Mr. R has been identified with the pany since 1936.

• **P. B. White** has been app manager of the Bond plan of ican Radiator & Standard Sa Corp., New York.

(CONTINUED ON PAGE 14

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European Letter . . .

• Necessity of common planning urged upon European nations by America seen as paradoxical . . . Deliberate reliance on complete rationing and physical controls indicates the mark of totalitarianism.

LONDON — The spectacle of America, stronghold of free enterprise, urging upon the sixteen ERP nations the necessity of common planning, is paradoxical in more ways than one. It is not only that the advice comes from the last place, ideologically speaking, one would expect it; it is that the international aspects of planning have been regarded as offering the most difficult problems and, indeed, constituting the Achilles heel of the whole concept. The planning urged by Mr. Hoffman, however, is more a coordination of policy and an estimate of its results than a plan in the sense in which Socialists understand the word; and indeed, the increasing extent to which planning is becoming a matter of international obligation makes it particularly important to decide just what are its intrinsic possibilities, difficulties and limitations.

There has of course never been an ideal planned society or even a genuine attempt to achieve it. Russion experience has little relevance to a free society, and the dictatorially imposed schedules of a physical plan can only be accepted by such a society as a strictly temporary wartime measure, as undesirable, even if as necessary, as blackouts or universal conscription. The same argument applies to such hangovers from wartime control as rationing. Rationing constitutes a confession that the economic system is not producing things in the proportions in which consumers want them; it may be the best and indeed the only immediate way of dealing with the emergencies of war and postwar dislocation, or with an income structure grossly incompatible with current social ideals, but it is essentially a wasteful and clumsy makeshift. In a genuinely democratic planned economy its necessity would be regarded as a clear indication of failure to use the price system either to elicit the right things or to distribute incomes in the right proportions. Deliberate reliance on rationing and on physical controls is, if complete, the mark of totalitarianism; if partial, the mark of the pseudo-plan. Britain, with its genius for muddling through (or at any rate for muddling), is just the country where pseudo-planning might be expected to yield the best results; but those results so far, apart from any judgment of their merits, throw no conclusive light on the theoretical possibility of successful democratic planning.

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QUITE an impressive case can be put for that theoretical possibility, as readers of the works of the market socialists are aware. Appositely enough, a new exposition of planning has lately arrived from America in the shape of a revised edition of Professor Carl Landauer's "Theory of National Economic Planning." It repays study. Planning need not involve physical interference and control; it need not imply public ownership except over that limited field of natural monopolies and communal services which would also need to be publicly controlled in the absence of a plan. It does require price-fixing, supplemented where necessary by taxes, subsidies and guarantees, but a flexible price-fixi such as should in theory res from the operation of the perfe market.

Professor Landauer assumes th the planners will not make the fa mistake—the Russian mistake— contenting themselves with a me accumulation of material statist of production, stocks, sales, ma power, capacity and so forth, h will also work out both supply a demand schedules for every co modity and service within the purview.

But the imagined spectacle of planning board trying to work ou in constantly changing circu stances, what every family a every business man in the comm nity will demand at every conce able combination of prices for conceivable commodities and wi every conceivable technique, enough to rouse the compassion those fairy-tale tyrants who s their victims to sort out overnig a barnful of mixed seeds. Nor the position really much improv if broad averages are struck f groups instead of individuals, a the less probable technical pos bilities ruled out from the sta The market does just that, was fully and clumsily, experimenti with men and goods instead of wi figures in a column; since the wo must be done, why not let the pla ners do it, and do it properly?

AND yet planning is essential the long run in order to re edy the recognized susceptibility capitalism to boom and slump. It equally essential in the short ru because adjustments which, und free enterprise, would have be made, have not in fact been ma and cannot be made at one blo without catastrophe, any more th a traveler who has taken the wro road over a mountain can safe rejoin the right one by jumpi down a thousand-foot cliff face. T ivory-tower analysis of Profess Landauer casts little light on th interim planning for special ends the only sort of planning, it is re sonable to suppose, that Mr. Ho man has in mind.

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Industrial News Summary...

- **Steel Demand Still on Top Rung**
- **No Chance of Decline This Year**
- **Galvanized Pipe Upped $6 a Ton**

STEEL consumers who think that steel supplies will be easier to get by the last quarter of this year are using rose-colored glasses. They won't. And it is becoming clear that domestic steel consumers will find steel even harder to get in the first quarter of next year.

Cuts in steel quotas for customers during the last quarter of this year are an established fact. Further cuts for the first quarter of next year are a definite probability on the basis of present market factors.

Reasons for the tight steel situation now and of that to come later are: (1) Loss of more than 1.6 million tons of steel because of the coal strike, (2) loss of pig iron urgently needed by small steel firms and foundries, (3) steady increase in the number and tonnage of defense orders, (4) certainty that Marshall Plan requirements will hit harder from now on, (5) general and human tendency for voluntary allocations which are increasing to reflect higher tonnages than would be the case if this system did not prevail and (6) sustained demands from consumers who were expected to order less steel.

This week steel pipe was the tightest steel item on the list. It was harder to get and in greater demand than steel sheets. Orders for pipe from oil companies run well into 1953 with some companies. That is academic. Oil companies want steel now. They are clamoring for it. Pressure from that industry for months to come will be steady, heavy and vocal. It will be bolstered by the defense angle of oil—which without more steel is hard to get in the quantities needed.

BUT shipbuilding and repair has caused a greater demand for plates. Demand for steel plates this week is reaching a new high. But since plates vie with sheets in getting available semifinished steel, that makes the sheet picture tighter, too.

Virtually every item on the steel list is a tight product. Alloy steels which just a few months ago were relatively easy to order are now a hot item. There is no longer any doubt that researchers, economic experts and steel officials are flabbergasted at the continuation of heavy steel demand.

Reports continue that household appliances in some cases are not moving as fast as a few months ago. This may be the case but the people who make these things are yelling for steel. Furthermore, makers of these items such as stoves, refrigerators and washing machines say that steel deliveries are falling behind promises. Field reports from appliance manufacturers do not bear out reports that their products are suffering setbacks in sales volume or demand. Take your pick on these opinions—but basic steel demand is unchanged.

Warehouses are not faring too well on steel supplies. As fast as they receive steel it passes out to customers. In some cases items are sold before are even received by the warehouse. Users in s towns and hamlets throughout the country are forgotten people—they say. In some cases small of steel ordered as long ago as last January are coming." In other cases these out-of-the-way sumers are getting only a fraction of what they ordered—or pleaded for. This may be the basis the general steel shortage cry that has some gressmen walking in circles—or hammering t desks.

Purchasing agents are getting leary and wear the repeated reports that steel supplies are to bec easier. Although they have at times pulled in t horns and have not ordered so far ahead, this be in for a change. Some PA's are believing steel is money in the bank and show no disposi to stop trying to get all the steel they can—whe they need it now or not.

THERE are some who think that defense needs mushroom late this year or early next with result that the domestic user will get less and steel. They are taking no chances.

Steel firms hope to see that voluntary allocat will not overlap regular steel mill quotas. If t customer is on the preferred list for allocated terial they hope to see that this comes out of regular quota for that customer—if he has one. easier said than done. A tug of war on this ques will be on for many a long month. Customers argue—and have started to in some cases—that allocated material is "special" and not "regular."

Steel users are none too sure that present prices represent the top. Steel mills have repeat said that if costs go up in steelmaking prices will to follow. The demand for higher freight rate coal, coke and iron ore—if granted—will defin mean higher steel prices. Steel officials claim are on the ragged edge of costs right now despite last increase.

Proof that increased costs will be passed on clear last week when pipe producers raised gal ized pipe prices $6 a ton to take care of the incr in zinc prices. Users of galvanized sheets auton cally pay higher prices if nonferrous coating mat rises in price. This is included in extra charges.

Reports are piling up that nothing will be don allocations (government ordered) until after elec But there will be talk before that time as the nur of voluntary allocations increase and it becomes ha to please everyone. The steel industry is g through a tougher time than it did in war days. T it could tell its customers that the government determining who got what and how much. Now firms take the guff themselves. And despite all steel output last week remained at 95 pct of capa

SAILING . . . SAILING—From over the bounding seas ll come German scrap. Bethlehem Steel Co. just closed leal whereby they will get about 150,000 tons of German ap. Carnegie Illinois Steel Corp. has come up with a rtion of the American divy—reported to be up to 200,000 ns. Signing contracts and getting the scrap are two ferent things. The scrap over there is so hard to prepare d ports are so crowded that it might take 6 months or ore before the orders are completed.

EVER UPWARD—Downward, when? The railroads ve asked for another freight increase on coal, coke and n ore. This comes right on the heels of Benjamin F. irless' request for lower freight rates and not too long er U. S. Steel's attempt to halt the inflationary price ral by cutting prices—and then finding that they would d up behind the 8-ball if they stuck by their venture. he interstate commerce commission is now studying this posal which asks increased rates on anthracite and uminous coal, coke and iron ore by 20¢ per net or gross n in the East and the South. Railroads tell ICC that es on these products have not gone up in recent years the same extent that rates on other commodities have reased. If granted, this raise would be added to the e just recently granted to the railroads by ICC.

A DEAD DUCK—The demand for beehive coke is unated. Every available beehive oven in this area is in eration. This is due to the high rate of operations, with eir subsequent demand for coke for blast furnaces. The hive boom is expected to continue for at least the rest this year. Eventually, however, demand for beehive ke is expected to drop off to the point where the beehive ens will be considered a thing of the past. When that ppens, the beehive might become a permanent dead duck. chnically, the beehive oven has long been considered out date. This is especially true when considered in the ht of the far more efficient by-product ovens. But the ehive oven is still the answer to emergency demand for ge tonnages of coke. That is being proven here now.

BRITISH PRICES UP—Price increases have been de on numerous products in England—mainly due to creased cost of coal. Basic pig iron went up 50¢ a ton; undry iron, 60¢; ferromanganese, 75¢; billets, $4; wire ds, $4.80; heavy rails, 70¢; heavy bar sections, 70¢; rolled bar sections, $4.80; and wire, $6.

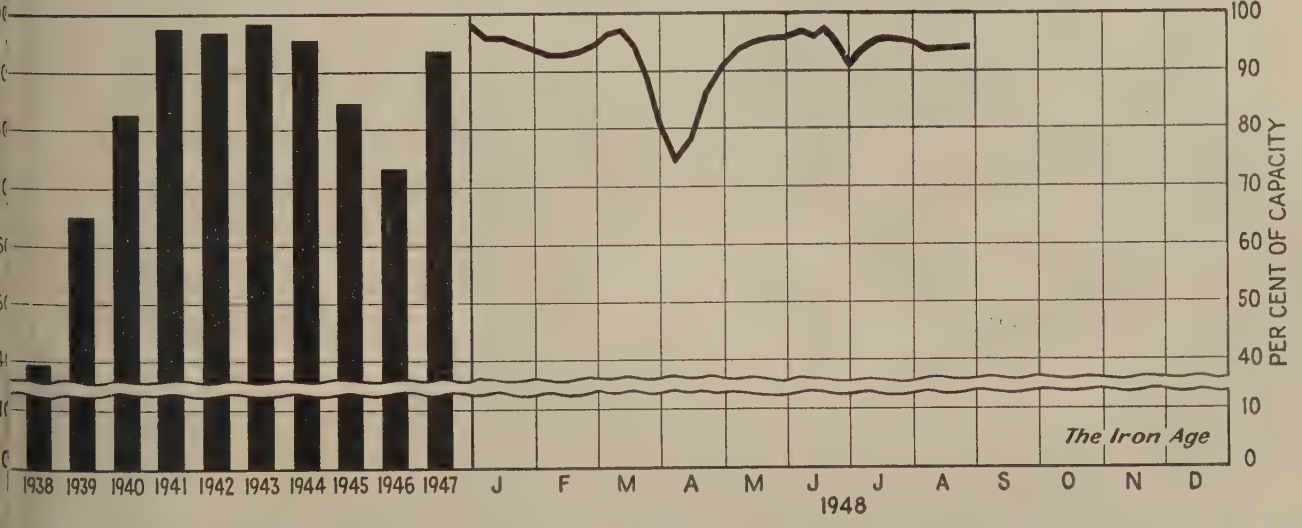
• **MAKING IT TOUGH**—It's tough to keep steelmaking output at capacity with all the hurdles placed in its way. The coal strike in the spring was one of the obstacles set up. Shortages of scrap and pig iron are others. Right now merchant iron production in the Birmingham area has been reduced sharply because of the contract negotiation snag that has been hit between the Sloss-Sheffield Steel & Iron Co. and District 50, United Mineworkers of America. In this case 3800 men are out on strike. This comes at a very critical time. It will undoubtedly hinder some companies in their attempt to build up some sort of scrap backlog to tide them over the winter months.

• **A BLUE RIBBON**—Men in the steel industry deserve one. The weather is hot as blazes. Vacations have had to be staggered to avoid shutdowns at periods of critical material shortages from time to time. Yet these men continue to put on the pressure, heat and all, to hold steelmaking up at about 95 pct of capacity. They're on the ball. And it is rough in the mills during the hot sultry summer months, especially about 4 in the afternoon, when that hot blanket closes in on them.

• **ON THE BANDWAGON**—Everybody wants steel. Everybody is jumping on the voluntary allocations bandwagon that can get on. The soft coal industry has made it known that they want a spot there, too. They have asked Secretary of Commerce Sawyer to name an advisory committee for their industry to try to arrange for a voluntary allocation of steel by the steel industry. This is the first step in the normal procedure to get steel. The soft coal industry claims they will need 376,000 tons yearly to assure maximum coal production. This is on the basis of an anticipated annual output of 620 million tons of soft coal.

• **A GRIPE**—Rep. Walter Ploeser, chairman of the House Small Business Committee, is whacking away at the Commerce Dept. as contributing to a serious domestic steel shortage. Ploeser says Commerce Secretary Sawyer has broken a pledge to cut down on steel exports. Insead, says Ploeser, export tonnages have risen sharply during the last quarter. Reason for the bone of contention, as Ploeser sees it, is that small businessmen are not getting their share of the steel being made and they have to pay premium prices in the gray or black markets for what they do get. This, however, is not an uncommon gripe these days.

Steel Ingot Production by Districts and Per Cent of Capacity



Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
97.5	94.5	90.0*	87.0	98.0	102.0*	100.0	102.0	102.0	83.0*	107.0*	80.0*	108.0*	95.0*
98.0	94.5	90.5	87.0	95.5	102.0	100.0	102.0	102.0	84.0	107.0	80.0	108.0	95.0**

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pectacular Steel Developments Marred by Distribution Rhubarbs

ttsburgh

• • The steel industry is going rough a period of rapid evolu-on. This is not to suggest that e industry ever stood still. But, nether it realizes it or not, dras-c changes in production and dis-ibution methods are forcing the dustry to lay aside old concepts d chart new courses.

By far the most spectacular de-lopment in steelmaking in recent ars is the process for continuous sting of liquid steel into semi-nished shapes, thus eliminating pensive and heavy soaking pits d booming mills. This develop-ent by Republic Steel Corp. and abcock & Wilcox Tube Co. was scribed at some length in THE ON AGE, Aug. 19, p. 72.

Not quite so spectacular, but ex-emely important in their own ght, are other technological de-lopments in steelmaking such as) use of oxygen in blast and enhearth furnaces, (2) beneficia-on of low grade ores, and (3) use closed, pressurized furnaces to duce melting time. These devel-oments will add to the nation's eelmaking capacity just as surely building new furnaces. This is point which steel officials have not ade as effectively as they might answering their capacity critics. ne reason for their shyness is that ey do not wish to tip their hands their competitors. But that is nother story.

In spite of these worthy advances the steel industry a big hulla-loo has come from another direc-on—steel distribution. In the face unprecedented demand, steel-akers have ben faced with the noying, frustrating, thankless job trying to divide the fruit of eir furnaces equitably and satis-ctorily. They have done so equit-ly in most cases. But they have ne so satisfactorily in few. No e will admit more radily than the elmaker that "you can't please eryone."

All the while this job was made ore difficult by the "pernicious ressure" of the Federal Trade mmission on the basing point stem of distributing steel. The owning blow was the Supreme urt decision in the Cement Case.

Requirements For Allocations And Defense Make Job of Dividing Steel Tough

o o o

By BILL PACKARD
Ass't. News, Markets Editor

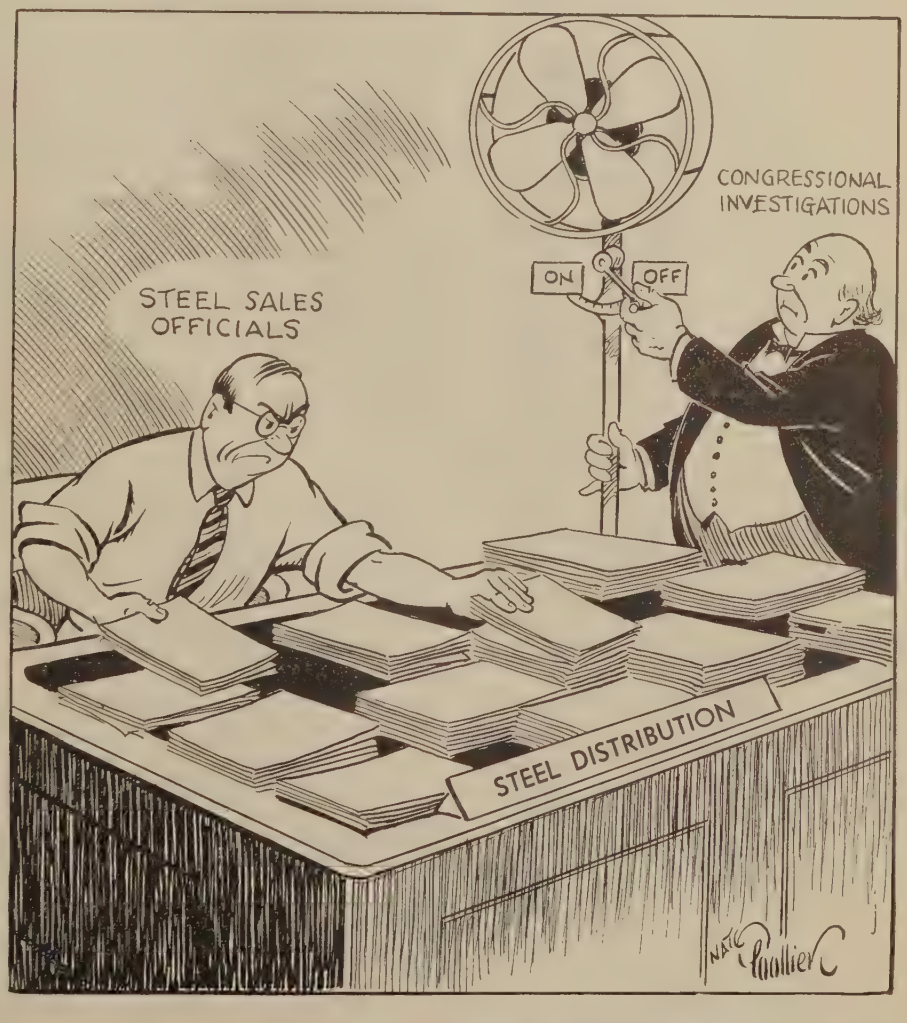
o o o

Any steel official will tell you that the change to f.o.b. mill selling was made with great reluctance. And he will probably add that the move followed careful study of the Supreme Court decision in the Cement Case—that the industry's top legal brains believed the decision would apply to the steel industry—that, consequently, the move was necessary in order to keep from breaking the law, as the Supreme Court had interpreted it. That is the industry's story. It is a convincing one.

Those who followed the long battle of the basing points know that the steel industry fought hard to save what it still believes is the best method of selling its products. The arguments, pro and con, have previously been propounded at some length, hence they have no place here. The current aim is to appraise the steel market situation in the light of f.o.b. mill selling.

Steel distribution problems still present a terrific challenge to the nation's steelmakers. In fact, the task of dividing the products of the steel industry is probably greater

"Watch Those Orders!"



Industrial Briefs . . .

• COPPER POWDER — The Superior Metal Powders Corp., Toledo, has announced that they have entered into the manufacture of copper powder designed for use in the field of powder metallurgy, paint and chemical industries. They are well established in the manufacture of iron powder.

• SALES AGENT — Milton Grandquist Co., 201 Washington Ave., N., Minneapolis, has been appointed sales representative of Cleveland Tapping Machine Co., Hartville, Ohio. They will cover Minnesota, western Wisconsin, northern Iowa and eastern North and South Dakota.

• MOVES — Announcement is made by Cutler-Hammer, Inc., Milwaukee, electrical manufacturer, of new and expanded quarters for the company's Dallas district sales office and warehouse at 1331 Dragon St.

• MIDWESTERN OUTLET— Vulcan Rail & Construction Co., specializing in pipe railing, bridge railing, pipe products and miscellaneous steel specialties, has recently opened a Midwest office with headquarters at 30 North La Salle St., Chicago.

• BUYS TOOL FIRM—M. O. Shepherd, formerly works manager at the Bunell Machine & Tool Co., Cleveland, has purchased Laeco, Inc., factory at 15215 Chatfield Ave., Cleveland, for the manufacture of special machines and tooling. The plant name has been changed to Shepherd Special Machine & Die Co. Officers are M. O. Shepherd, president; Dan E. Shepherd, vice-president, and Dick A. Shepherd, secretary.

• CHANGES NAME — Announcement has been made by the Cowles Detergent Co., Cleveland, that they have changed their name to Cowles Chemical Co. No change in ownership, management or policy is involved.

• NEW PLANT — Completion of the structural framework of the new $500,000 Maneely chemical plant at Wheatland, Mercer County, Pa., being erected to convert waste materials of the Wheatland Tube and Wheatland Steel Products Companies into valuable chemicals, was reported recently. It is planned to offer this service to other manufacturers having similar waste problems.

• MORE PRESSES—The Federal Machine & Welder Co. has arranged to purchase the plant and facilities of the Warren City Mfg. Co., Warren, Ohio, from the U. S. Navy. Federal has been operating this plant, building a complete line of all-welded steel presses, since January, 1946, when it acquired the stock of the Warren company.

• WAA SALE—WAA has announced the sale of two adjoining government-owned surplus aircraft parts plants at South Bend, Ind., to the Bendix Aviation Corp. for $1,050,000, cash, subject to the national security clause. The properties were erected by the government at a reported cost of approximately $1,578,000 for the production of carbureters and machine parts.

• ACQUIRES PATENTS—The Cyril Bath Co., Cleveland, machine tool and special machinery manufacturers, have recently acquired the Goodyear patents on roto forming in the United States, Canada and England. The Goodyear Aircraft and the Cyril Bath Co., developed concurrently, machinery and methods for forming parts by stretching metals to their elastic limits and then while under tension, forming upon a rotary moving table.

• APPOINTS DEALER—Adelson-Wirts, Inc., 1800 Park St., Hartford, has been appointed an authorized dealer in Airco products by the Air Reduction Sales Co.

Steel Developments

now than it was before the ind try capitulated in its battle to s the basing point system.

It is hard to bring up the s ject of steel demand and sup without also talking about f. mill selling, and a number government and industry progra which call for steel. What one dustry spokesman always tries make clear in the beginning," that he "never did believe that ing f.o.b. mill would ease the e mounting pressure for more ste Questioned about the "evermo ing pressure for more steel," declared that he didn't mean total demand was either stronge weaker. But that more and m consumers of steel were be placed in preferred groups wh served to make the demand pict appear tighter.

Steel consumers are swarmin Washington, as well as to steel s offices, in their efforts to ob more steel. A great many of th are armed with proposals for clusion in the voluntary allocati or defense programs—a sure to get steel. Or so they think. result of this the number of posals for voluntary allocation grams has probably exceeded original intent of Congress whe passed the legislation.

Some sources in the industry lieve the number of voluntary cations programs under consid tion has become fantastic. H ever, Commerce Dept. denies It declares that there are abou programs roughly in operation well advanced. It also reports there are not more than 20 grams receiving any kind of sideration.

There is no doubt that some dustries have made informal proaches and have been equally formally refused. Both Comm Dept. and the steel industry p out that the law is rather spe about "national interest" bein requisite for inclusion in volun allocations programs.

"Not all of these voluntary cations programs are actually quiring more steel than the in tries would normally receive," steel official pointed out. He li freight car builders as an exa and said he believed they w probably be getting about as m steel even if there were no al tions program in existence. S

others are undoubtedly receiving more than they "normally" would. Hot air furnace makers were cited as an example of this group.

One of the newest worries of the harried steel sales departments is the shipbuilding program. They point to recent authorizations for substantial building of tankers and various types of warships. The crux of the problem here is that, as a result of the very meager shipbuilding program since the end of the war, the shipyards have practically no steel quota on which to draw. At this point the sales official draws a picture of a pie cut into various sized pieces to represent the quotas of steel consumers. "Now, if we have to make this piece much larger, we must make some of the others smaller." "Which ones would you trim, and how much" "It's just a case of robbing Peter to pay Paul—only it's done with steel quotas." "They tell us who has to receive more steel, but they won't tell us what good customers' quotas must be cut."

"But that's not all. Ships take plate. If we make more plate we must (1) make less sheet or (2) make less pipe. Demand for these items is currently tighter than a ¼-in. nut on a 1 in. bolt. Steel for these ships will undoubtedly be classed as a military order, which it is."

This brings up another problem. What happens to consumer quotas when a military order requires a particular item? To illustrate this, let us suppose that a mill makes 10,000 tons of sheet per month. Let us also suppose that it has 10 customers, each with a quota of 1000 tons per month. Now this mill cannot make more than 10,000 tons of sheet per month, since that amount represents total capacity.

If one of the 10 customers gets a defense order requiring 500 tons of sheet per month, what happens? Does this consumer then get 1000 plus 500, or 1500, tons of sheet per month, while the other customers of the mill are trimmed proportionately? Or does the customer with the defense order still get only his regular quota of 1000 tons? While exact procedure cannot be determined in all firms, it appears that the steel sales departments favor the latter method of distribution.

But if some firm other than the historic 10 above receives a bona fide defense order which requires sheet, and it has no mill quota, the first solution would probably be used. Or if one of the 10 consumers on the mill's historic list receives a defense order requiring more than his quota, again, all other customers would have to face proportionate cuts in their quotas.

Probably no steel mill in the country is faced with a situation exactly like this hypothetical example. Actually, their problems are vastly more complex. Then, too, most of them have a certain amount of flexibility in shifting production from one item to another. Yet problems of this type are actually confronting the sales departments of the various steel firms.

Producers, who have had long experience with priorities and allocations, are still more than a little worried about the possibility of government controls. Their worry is based on the premise that the various government-sponsored "must" programs will continue to expand. They point out that, if the present trend of more and more steel output being channeled into these must programs continues, it might become necessary, even practical, to allocate all steel. The remaining pieces of the pie might become too small to trim, they believe.

At the same time, they do not blame the individual steel consumers for trying to improve their supplies by getting themselves included in one of the favored categories of consumers. They admit that fourth quarter quotas have been slashed on an average about 4 to 5 pct. On some specific items these cuts have amounted to as much as 10 pct, while on some others there has been no cut.

On the basis of an informal survey here the following points seem to be contributing to the mounting pressure on steel distribution: (1) Voluntary allocations program, (2) European Recovery Program, (3) defense requirements, (4) pressure from Washington, (5) pressure from specific industries and organizations and (6) pressure from individual customers.

Not all of these points actually require definite outlays of steel. But all of them are seen here as contributing to the unrelenting pressure on steel distribution.

Attempting to measure current steel demand by backlog orders is a fallacious method of market analysis. For one thing, some mills have displayed extreme reluctance to book orders "too far in the future." There are several reasons for this. But probably the chief one is uncertainty over the eventual requirements of the defense program.

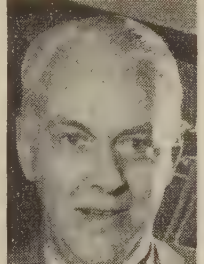
The impact of this program on the steel industry has been slow in arriving. It has also been smaller than was at first expected. But steelmakers here believe that it will gradually increase during the months ahead. The thing that has them worried is that they don't know how much. Meanwhile, they are attempting to keep as much future tonnage as possible "open" on their books to meet this unknown contingency.

Westinghouse Appoints New Science Lecturer

Pittsburgh

• • • **Dr. Richard C. Hitchcock** has been appointed science lecturer for the Westinghouse Research Laboratories, according to Dr. J. A. Hutcheson, laboratory director.

Dr. Hitchcock has spent over 30 years in the laboratories and on the lecture platform for Westinghouse.



R. C. Hitchcock

He will tour the country with a special science show that has been designed to make latest scientific advances easily understandable.

Ten patents have been credited to Dr. Hitchcock. He has also written over 50 papers on physics and electronics and has authored many popular articles.

Declares Dividend

Pittsburgh

• • • **Directors of** the National Steel Corp. have declared a dividend of $1 per share for the third quarter of this year, according to Ernest T. Weir, chairman of the board.

The dividend applies to stockholders of 2,230,817 shares.

Republic Furnace To Keep On Operating; Expect Early Truce

Washington

• • • Pig iron is going to keep on flowing out of Republic's Stack No. 5 in Cleveland and no regular customer is going to be struck from the books.

Two committees of Congress adopted this platform last week and are now negotiating with Republic Steel Corp. and Kaiser Co., Inc., to determine just how the continued operation of the disputed blast furnace will be carried out.

A majority of the members of both the Senate Small Business Committee and a House Expenditures Subcommittee headed by Representative Bender, R., Ohio, believes that Henry Kaiser and C. M. White, president of Republic, will this week come to terms on operation of the furnace.

Senator Wherry, R., Neb., chairman of the Senate group, is acting as umpire in the four-way dispute which includes Jess Larson, head of War Assets Administration. Mr. Larson testified in a public heading last week that he signed a 20-year lease on the furnace with Mr. Kaiser only after Mr. White declared he "wanted to get out of the pig iron business."

The federal government's main stake in the forthcoming settlement is to see that pig iron customers are taken care of. Senator Wherry, Mr. Larson, and officials of executive agencies of the government, declared they were not interested in who will operate Stack No. 5 so long as the regular customers are taken care of.

But who are the "regular customers"? A number of members of the two Capital Hill committees say they believe the list of "regular customers" referred to in committee hearings is padded.

Raymond L. Collier, executive vice-president of the Gray Iron Founders Society, of Cleveland, told the committee that some 250,000 tons of pig iron a year will be lost if the furnace shuts down. Committee members feel that if the "fat" (i.e., "customers" who were not on Republic books but who would like to be) is pared from the founder's claims, the regular customers won't suffer, no matter who operates the furnace.

As far as control of the furnace is concerned, Mr. Larson insisted WAA had a firm lease with K-F for 20-year operation of the stack, plus option to buy. He said he awarded the lease to K-F because (1) Republic repeatedly stated that it wanted to get out of the pig iron business in the North, (2 K-F offered more money and was bound to "get the best retu for the federal government."

But whose bid was largest st is one of the most hotly contend angles to the dispute. Since t rental over the 20-year period is be calculated on the basis of outpu both Republic and K-F stoutly d fended their individual bids as b ing the highest.

Although Mr. Larson declar that the K-F bid offered a more f vorable return to the governmer Mr. White testified he was "co vinced that Republic's rejected b would have given the governme a more secure return, and ve likely a greater return than th provided under the arrangemen with the Kaiser-Frazer Corp., a at the same time it would ha prevented a disastrous dislocati in pig iron supply for an importa segment in American industry."

Mr. White added that he thoug Mr. Larson was "just mad" becau Republic would not meet what called WAA's "exhorbitant terms

"Why do you think Larson g in touch with Henry Kaiser?" Se ator Wherry asked.

"I think Larson was just ma because we wouldn't meet h terms," Mr. White said. "Instea of kicking the cat or throwing chair through the window, he we out and made a deal with Kaise Frazer," he added bitterly.

Also in sharp dispute during th hearing was the issue unscra bling Stack No. 5 from other R public properties. Mr. White test fied that it would take $4 millio to make Stack No. 5 independe of other Republic facilities in th area. Mr. Kaiser admitted this fi ure was "probably about right, but added that he saw "no reaso why a deal could not be worked ou with Republic to reduce or elim nate the need for unscrambling.

Republic-Kaiser Truce

Cleveland

• • • Until May 1, at least, Republic Steel Corp. will run the WAA blast furnace here. Republic will pay K-F the same rental it (Republic) had offered WAA and will sell 5000 tons of pig iron a month to K-F at the market price. Republic foundry iron customers who were on the verge of losing out will receive regular tonnages during that time. The Republic-K-F agreement is considered a temporary truce by Republic which will attempt to have the WAA lease to Kaiser-Frazer voided in favor of the one it had submitted.

K-F of course will continue to argue that its lease which started all the fuss is the best thing for WAA. K-F is paying more for the lease than it is getting from Republic over the next 9 months but the cost of pig iron, over and above the market price to be paid to Republic, will be no more than 50¢ a ton or so—a small premium to pay these days for pig iron. Kaiser-Frazer has the furnace and will take it over next May unless Republic wins its arguments before that time.

AMERICAN IRON AND STEEL INSTITUTE
350 Fifth Avenue, New York 1, N. Y.

Blast Furnace Capacity and Production—Net Tons

JULY - 1948
Month

	Number of companies	Annual blast furnace capacity	Production							
			Pig Iron		Ferro manganese and spiegel		Total		Percent of capacity	
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
Distribution by Districts:										
Eastern	11	13,093,560	944,052	6,175,163	33,256	197,225	977,308	6,372,388	88.3	83.6
Pittsburgh-Youngstown	17	25,588,120	1,874,552	13,123,570	13,303	149,889	1,887,855	13,273,459	87.3	89.1
Cleveland-Detroit	6	6,495,000	481,632	3,377,993	-	-	481,632	3,377,993	87.7	89.4
Chicago	7	14,700,290	969,009	6,921,313	5,094	10,190	974,103	6,931,503	78.4	81.0
Southern	8	4,949,660	374,427	2,533,442	7,996	56,102	382,423	2,589,544	91.4	89.9
Western	3	2,612,300	196,608	1,316,586	-	-	196,608	1,316,586	89.0	86.6
Total	35	67,438,930	4,840,280	33,448,067	59,649	413,406	4,899,929	33,861,473	85.9	85.2

WAA Ordered To Dispose of All Remaining Surplus Holdings

Washington

• • • Sell out your stocks and turn in your books by Feb. 28, 1949. These are the orders issued to the field offices of War Assets Administration.

Remaining for disposal on July 1 were 13.2 billion in real property, exclusive of facilities on lease, $760 million worth of aircraft and parts, and $475 million in personal property. Included in the inventory were 29 iron and steel facilities originally valued at $140 million.

These steelworking installations are all that are left over from nearly 150 such facilities declared surplus to WAA. The remainder have been turned over to private industry either through outright sale or under leasing arrangements.

Of the actual disposals, 89 properties which cost the government around $615 million have been sold and 29 have been leased. A number of these are subject to the national security provisions.

Included in the disposals are coke ovens having a rated annual capacity of nearly 4.5 million tons; blast furnaces, 6.2 million tons of pig iron; and, open hearth and electric furnaces, 4.7 million tons of ingots.

Rated capacities of the unsold properties approximate more than 325,000 tons of steel castings, 675,000 tons of ingots, 895,000 tons of pig iron, and varied quantities of ore and coke.

WAA officials do not see the job as tough, except in disposal of real property. Congress put an end to making new surplus declarations and ordered a stop in general to priority buying as of August 31. After that date, personal property will be sold by competitive bid to all buyers except to the armed forces which still get first call.

A modified priority system will be exercised on real property until December 31. Institutional donations will continue and the Federal Works Agency may obtain equipment priority for veteran training schools. Needs of the armed forces need no specific priority under the Surplus Property Act; also, WAA must give consideration to government agencies and small business.

Field offices are given only until December 31 to get rid of personal property; aircraft and components must be disposed of by February 28. Industry agents will continue to sell aviation surpluses until the end of the year.

Disposal of Real Property Presents Big Problem In Closing Books

By KARL RANNELLS
Washington Bureau

Remaining real property presents a tough problem. The remaining $3.2 billion worth is largely plants for which there is little demand. Many are very large or scrambled facilities, particularly in cases of iron and steel facilities such as the four war-built Copperweld facilities at Warren or the two Scullin foundries at St. Louis.

Included in the facilities yet to be sold are 14 foundries (see table), three forge plants, and 11 miscellaneous works. Of the total, 19 are under sales negotiations; 18 of the 29 are subject to the security clause.

Problems of real property will not end for another decade or more. In addition to the unsold properties, still another billion dollars worth are operating under lease to private operators for varying periods.

Upon demise of WAA, responsibility for the leased and unsold plants will go to the Reconstruction Finance Corporation. Unsaleable plants which have been picked by the Defense Dept. and the Munitions Board as being essential to national defense will be turned over to the Federal Works Agency.

The FWA's newly created Industrial Property Division will take charge of such plants and maintain them in standby condition for quick reactivation. Congress has authorized an initial $5 million to get the industrial reserve plan under way.

SURPLUS PROJECTS AVAILABLE FOR DISPOSAL

COMPANY, LOCATION	COST	WAR USE	RATED ANNUAL TONNAGE
IRON AND STEEL FACILITIES			
Alan Wood Steel Co., Ringwood, N. J.	$3,923,000	Iron Ore	418,000
*Copperweld Steel Co., Warren, O.	.....	Ingots (Elec.)	142,000
*Copperweld Steel Co., Warren, O.	.....	Heat Treating	28,000
*Copperweld Steel Co., Warren, O.	.....	Annealing	45,000
*Copperweld Steel Co., Warren, O.	19,224,000†	Pig Iron Ingots	550,000 410,000
National Lead Co., Tahawus, N. Y.	2,457,000†	Ore Reduction	550,000
Republic Steel Corp., Cleveland, O.	28,053,000†	Pig Iron Coke	395,000 450,000
*Republic Steel Corp., Warren, O.	964,000	Sponge Iron	35,000
Republic Steel Corp., Birmingham, Ala.	116,000†	Coal Washer	48,000
Rotary Electric Steel Co., Detroit, Mich.	1,209,757†	Hot Metal	.....
FOUNDRIES			
*Amer. Steel Foundries Indiana Harbor, Ind	$26,137,759	Armor Castings	108,000
*Atlantic Steel Castings Co., Crum Lynne, Pa.	1,052,311	Steel	6,000
*Buffalo Brake Beam Co., Buffalo, N.Y.	857,099†	Malleable Steel	1,400
*Columbia Steel Co., Pittsburgh, Pa.	8,485,907	Steel	30,000
FOUNDRIES (Continued)			
*Continental Fdry & Mch. Co., Coraopolis, Pa.	$2,486,268†	Steel	19,200
*Continental Fdry & Mch. Co., East Chicago, Ind.	5,758,091	Steel	30,000
*General Metals Co., Oakland Cal.	1,989,000†	Steel	12,000
Key Co., E. St. Louis, Ill.	1,833,127†	Steel	5,400
Maryland Sanitary Mfg. Co. Baltimore, Md.	1,674,118	Steel	.....
National Erie Corp. Erie, Pa.	542,036†	Steel	10,200
*Ohio Steel Foundry Co., Lima, Ohio	3,786,545†	Steel	7,200
*Pacific Car & Foundry Co. Renton, Wash.	2,910,659†	Steel	.....
*Scullin Steel Co., St. Louis, Mo.	3,099,577†	Steel	21,000
*Scullin Steel Co., St. Louis, Mo.	12,627,211	Steel	72,000
FORGE PLANTS			
*Barium Steel Co., Inc., Canton, O.	$664,609†	Forgings, Ingots	.....
*Champion Machine & Forging Co. Cleveland, O.	3,826,984	Forgings	.....
Leard, Wm. E. Co., Inc., New Brighton, Pa.	438,000†	Forgings	.....

* Subject to National Security Clause.
† Negotiations pending.

Economic Mission to Determine Extent of U. S. Aid to Brazil

Rio de Janeiro

• • • **Brazil and** the United States are finally going to get down to brass tacks and talk business—business economics. They hope to reach an understanding on who gets what, for what is put up.

Over a year ago the government here requested a mixed United States-Brazilian Economic Commission to discuss trade relations between the two countries. This they were promised. Whether delay has been due to inability of the United States to find the right man to head the commission as Herschel Johnson, U. S. Ambassador here, explains or because of failure on the part of Brazil to have a definite plan in mind is open to conjecture.

But Brazil has now mapped out a 5-year plan, their Salte Plan. And the United States has named John Abbink, chairman of the McGraw Hill International, to head the commission. So the foundation is laid.

Mr. Johnson says, "Mr. Abbink is not coming down here to criticize, nor to make recommendations on specific projects or their financing—but he will take these projects into account."

The real purpose of his trip will be to get first-hand information on the plan and also to determine the extent to which cooperation is practical.

His job is important. There are several factors that are vital to American interests if the Salte Plan is to be seriously undertaken.

First, the Brazilian Congress is driving a pretty hard bargain with their stringent petroleum laws. These will have to be tempered considerably before American companies will take an active interest in developing oil reserves here. Oil men and diplomatic sources have failed to make any progress so far. But if the Salte Plan is to make itself self-sufficient, as is its chief aim, foreign aid from somewhere is essential.

Then, American interests are bent on making a success of the Companhia do Vale do Rio Doce whose chief function is exploitation of the vast iron ore reserves at Itabira. So far Americans have sunk $26½ million in the development of these reserves, according to Mr. Martin, chairman of the Export-Import Bank. The first $14 million can be written off. This is an important factor in view of the depletion of iron ore reserves in the North American continent.

Finally, Brazil needs money to stabilize her business structure. She cannot develop the resources she has without money. Neithe can the Salte Plan be a succes without foreign aid.

Despite the money American have spent down here, Brazil ha nothing against doing busines with countries other than th United States.

French-Brazilian talks here re cently resulted in an agreemer where 4000 million blocked franc will be used to buy refinery equip ment and 103 narrow gage Frenc locomotives within the next 2 year

In May, British-Brazilian agree ments were expanded to furthe foster their trade relations.

These will be some of Mr. Ab bink's problems. So if we want t stay in the running—it might a end up with recommendations fo further development loans to Bra zil with which she can buy Amer can machinery.

That's where the business ecc nomics comes in—determining th point of diminishing returns.

Canadian Steel Output At 83.4 Pct of Capacit

Toronto

• • • **Canadian production** c steel ingots and casting for Jun totaled 259,365 net tons. This i an average daily rate of 83.4 pc of rated capacity.

May output totaled 289,567 ton an all time record, and a daily aver age of 90.1 pct. June, 1947, outpu amounted to 238,297 tons for daily average of 81.7 pct of rate capacity.

For the month under review pro duction included 249,710 tons c steel ingots and 9655 tons of stee castings.

Charges to steel furnaces in Jun included 135,079 tons of pig iron 77,129 tons of scrap of consumer own make and 77,275 tons of pur chased scrap.

In the first 6 months this yea cumulative production of steel in gots and castings totaled 1,595,59 net tons as compared with 1,483 281 tons for the same period i 1947 and 1,449,639 tons in 1946.

Following are comparative month ly production figures for 1948 i net tons:

1948	STEEL INGOTS	STEEL CASTING
January	247,768	8,958
February	230,182	9,463
March	275,349	10,677
April	254,315	9,951
May	279,688	9,879
June	249,710	9,655
Total, 6 months	1,537,013	58,583

Coming Events

Sept. 6-10 American Chemical Society, national meeting, St. Louis.
Sept. 13-17 American Chemical Society, national meeting, Portland, Ore.
Sept. 13-17 Instrument Society of America, conference and exhibit, Philadelphia.
Sept. 28-Oct. 1 Assn. of Iron & Steel Engineers, Convention and Iron and Steel Exposition, Cleveland.
Oct. 4-7 American Institute of Steel Construction, annual convention, Quebec, Canada.
Oct. 5-7 Industrial Packaging Engineers Assn., Industrial Packaging and Materials Handling Exposition, Chicago.
Oct. 5-9 Concrete Reinforcing Steel Institute, semiannual meeting, Asheville, N. C.
Oct. 11-13 National Lubricating Grease Institute, annual convention, Chicago.
Oct. 11-13 American Society Tool Engineers, semiannual meeting, Los Angeles.
Oct. 13-15 Porcelain Enamel Institute, annual forum, Urbana, Ill.
Oct. 14-15 Gray Iron Founders' Society, annual meeting, Atlantic City.
Oct. 18-22 National Safety Congress and Exposition, Chicago.
Oct. 22-25 Metal Treating Institute, annual meeting, Philadelphia.
Oct. 23-29 American Society for Metals, annual convention, Philadelphia.
Oct. 24-29 American Welding Society, annual meeting, Philadelphia.
Oct. 25-27 American Institute of Mining and Metallurgical Engineers, Metals Div., fall meeting, Philadelphia.
Oct. 25-27 American Gear Manufacturers Assn., fall meeting, Chicago.
Oct. 25-29 National Metal Exposition, Philadelphia.
Oct. 27-28 Society for Nondestructive Testing, annual convention, Philadelphia.

Iron and Titanium Producing Plant Under Development in Canada

Sorel, Quebec

• • • **Iron and titanium** will be produced in commercial quantities from the same ore, in the same plant here within the next 3 years. But right now everything is still in the development stage.

This novel combination of ferrous and nonferrous production results from an unusual ore deposit at Lake Tio in the Allard Lake section of the Lower Romaine Valley and a large capital investment by the Quebec Iron & Titanium Corp., a subsidiary of the Kennecott Copper Corp. and the New Jersey Zinc Co.

A newly formed Canadian company, the Allard Lake Mines, Ltd., will work in conjunction with the Quebec Corp. Russel J. Parker is president of the enterprise. A. H. Robertson is vice-president and will be in charge of operations in Canada.

Diamond drilling at the Lake Tio Cliff orebody has outlined over 125 million tons of easily accessible titanium bearing ilmenite ore. This is the largest deposit of its kind in the world.

Composition of this ore averages 35 pct titanium oxide and 40 pct iron. This is a higher titanium percentage than the famous MacIntyre orebody in New York State posses. The iron content compares with the 51 pct iron of the Mesabi range ores.

The initial investment in the development of this project will run about $25 million. This will involve the development of the ore deposits, construction of a 28-mile railroad from the ore fields to Havre St. Pierre on the Gulf of St. Lawrence, building ore docks and storage facilities at Havre St. Pierre and construction of smelting facilities here at Sorel.

The tremendous potential of the ore reserves in the Allard Lake region and of the iron and titanium production indicates that this project may eventually warrant expenditure of as much as $150 million. It is hard to estimate right now just what the limitations really are.

An ample and readily accessible supply of electric power generated by the Shawinigan Water & Power

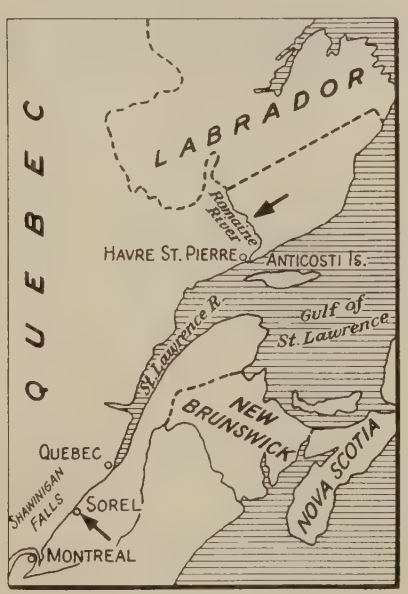
Abundant Allard Lake Ores Will Be Processed To Yield 2 Products

By STEVE SMOKE
Associate Editor

Co. at the nearby Shawinigan Falls plays an important part in the success of this project.

The proposed smelting plant here is to consist of six of the largest

HERE'S WHERE: The upper arrow indicates location of the Allard Lake ore deposit in the Lower Romaine Valley. The lower arrow points out Sorel where the smelter is to be constructed.



electric furnaces known. These new type electric smelting furnaces will call for large quantities of power. Preliminary requirements are estimated at 100,000 hp of electrical energy.

Such a power supply is essential so that the ore can be reduced to iron without harming the titanium in the slag. The titanium must remain in the slag in an acid soluble state so that it can later be leached out by sulfuric acid treatments.

The smelter will have a rated capacity of about 1500 tons a day. It is estimated that output from the processing of 500,000 tons of the ilmenite ore will yield approximately 250,000 gross tons of titanium slag and 175,000 gross tons of high grade iron annually.

The smelting process is unique in that the product from melting down the iron ore is not pig iron but a low carbon iron. This product is earmarked for conversion in Canadian mills and sale from Canadian markets.

Some of the titanium slag, however, has already been contracted for export to United States markets. It is estimated that this will run between $5 and $10 million annually.

Titanium metal, on which the future of the Allard Lake project is based, is the eighth most plentiful element in the earth's crust. It weighs about half as much as steel, can be easily rolled or drawn, and has an annealed tensile strength of 82,000 psi. Cold rolling to 50 pct reduction produces a tensile strength of 126,000 psi.

At present titanium is well known as a stabilizer in stainless steels. But it also has excellent corrosion resistant properties itself.

Considerable research work is under way in both the United States and Canada to develop the manufacture of titanium metal and its applications to a point where it could compete costwise with stainless steels.

Of course, realization of such a goal is far in the future. But the metal is plentiful; its physical properties compare in certain respects with some of the stainless steels; and cost reductions that will make its production commercially competitive is something that will come only with time.

The project is yet in its infancy. But plans have been carefully made and production is scheduled to start late in 1951 or early in 1952. It is more or less a long range proposition. But it does appear that Canada will have a new and important industry in the near future.

Construction Steel . . . .

New York

• • • **The estimated total bookings** of fabricated structural steel for the month of July, according to reports received by the American Institute of Steel Construction, Inc., were 167,960 tons, or an increase of 3.4 pct over the previous month. Bookings for the first seven months of the year have totaled 1,130,049 tons, representing an increase of 23.9 pct over the 911,593 tons booked in the same period of 1947.

A preliminary estimate of the July shipments gives a total of 135,584 tons, with a seven months total of 1,101,243 tons, up some 5 pct from the seven months total of 1947.

The backlog (tonnage available for future fabrication) for the next four months only, stands at 613,200 tons.

Following is the complete tabulation of bookings and shipments:

ESTIMATED TOTAL TONNAGE FOR THE ENTIRE INDUSTRY

Contracts Closed	1948	1947	Avg. 1936-40
January	160,634	104,973	107,578
February	130,119	125,881	96,280
March	213,123	149,634	124,558
April	154,082*	161,338	110,783
May	141,764*	112,954	126,237
June	162,367*	103,273	125,835
July	167,960	153,540	152,481
Totals	1,130,049	911,593	843,752
Shipments			
January	146,362	140,650	92,578
February	141,556	136,126	88,626
March	167,029	137,799	115,031
April	166,687*	157,392	123,650
May	186,915*	154,980	123,225
June	157,109*	151,882	129,969
July	135,584	169,911	127,422
Totals	1,101,243	1,048,740	800,501
Tonnage available for fabrication within next 4 months..	613,200	660,919	369,892

* Revised.

• • • **Fabricated steel awards** this week included the following:

1600 Tons, Buffalo, 5-story addition to Trico Products Corp. plant, to Bethlehem Steel Co., Inc., Bethlehem, Pa., through Siegfried Construction Co., Inc., Buffalo.

• • • **Fabricated steel inquiries** this week included the following:

3200 Tons, Queens, N. Y., crossing elimination, Long Island R.R. Co.
3000 Tons, Point Comfort, Texas, Aluminum Co. of America.
2000 Tons, Milwaukee, Wis., manufacturing plant, Continental Can Co.
2000 Tons, Pittsburgh, manufacturing plant, Continental Can Co.
205 Tons, Stonington, Conn., clear span solid floor deck plate girder bridge.
100 Tons, East Lyme, Conn., span composite girder bridge.

• • • **Reinforcing bar awards** this week included the following:

810 Tons, Chicago, Allstate Insurance Co. building, through B-W Construction Co., Chicago, to Truscon Steel Co., Cleveland.
240 Tons, Carbondale, Ill., training school alterations for Illinois Normal, to Federal Construction Inc., Chicago.
180 Tons, Queens, N. Y. building, A. Bleyer Co., to Capitol Steel Corp. of N. Y.
100 Tons, Chelsea, Mass., tank foundation, Gulf Oil Co., to Northern Steel Co., Boston.

• • • **Reinforcing bar inquiries** this week included the following:

550 Tons, Chicago, North Shore Intercepting sewer contract No. 7, Chicago Sanitary District, bids close Sept. 2.
128 Tons, East Lyme, Conn., span composite girder bridge.

J&L Sells 30-in. Strip Mill

Pittsburgh

• • • **Jones & Laughlin Steel Corp.** has sold a 30-in. hot strip mill at its Otis works, Cleveland, to Alan Wood Steel Co. of Conshohocken, Pa. Alan Wood will take possession of the mill about Oct. 1. The mill equipment will be dismantled, rebuilt and moved to Conshohocken.

Progress in J&L's $12,700,000 program to improve other hot rolling facilities at the Otis works has enabled disposal of the mill, acco ing to the company. After Sept. the Otis 77-in. hot strip mill, n undergoing remodeling, will roll steel produced at the J&L Cle land plant. Strip from this n will be slit to required narrov widths.

J&L's improvement of hot rolli facilities at Otis will separate blooming mill from the 77-in. strip mill. Included in the progr and now in process of construct are: (1) improvement of steel s handling and storage faciliti (2) installation of new slab sh and transfer table, (3) construct of three new reheating furna and furnace delivery table, (4) stallation of a new four-h roughing stand and hydraulic sp system, (5) extension of the n building and installation of n coilers and coil conveyers, (6) re cation of trackage and skull bre ing yard.

Construction on the project gan in September, 1947, and scheduled for completion late 1949.

50 YEARS AGO

THE IRON AGE, *August 25, 1898*

• "Oliver Mining Co. has purchased some of the most valuable mines in the Vermillion range which gives the Carnegie Steel Co. an advantage in the cost of raw materials. This might also be interpreted to mean that the Carnegie interests are farsighted enough to see that there is an end to the supplies of Bessemer ore in the lake country, even with the recent exploitation of the Mesabi."

• **Samuel Mather of Cleveland is credited in newspaper dispatches with the statement that negotiations are under way to consolidate the Illinois Steel Co., Minnesota Iron Co., Cambria Iron Co. and Lackawanna Iron & Steel Co. This statement has been received with much incredulity in the trade."**

• "A modification of the open-hearth process which uses the ore in a molten condition is reported from Russia."

• "Indications are cropping out in various directions that some of our leaders of industry are not quite willing to accept off-hand the old maxim: 'The trade follows the flag.' Since we are having this axiom flung at us at every occasion, it may be well to have those who believe in it state the facts which entitle it to support. These are cold blooded business men who insist that it is a question of prices and goods and not the flag which waves over the ship. The fact that we do an immense export trade, although our flag is little seen on the seas, needs some explanation."

• **"Officers of the Ordnance Bureau of the Navy Dept. tested the first armor plate made in this country under the Krupp process, the secrets of which were recently acquired by the Carnegie Steel Co. The plate developed qualities little short of marvelous."**

Weekly Gallup Polls . . .

Red Hearings Confirm Public Suspicion of Communists

Princeton, N. J.

• • • Although the Washington spy hearings have put a fresh and lurid emphasis on the Communist issue, the American people have been acutely suspicious of Communists in this country for at least ten years, according to George Gallup, director, American Institute of Public Opinion.

The suspicion first took firm root after August, 1939, when Moscow signed the pact with Hitler, and rests principally on the belief that American Communists are loyal to Russia, not the United States, and that in any war against the Soviets they would work in the interests of the enemy.

In short, the Communist Party in America is not viewed by the people as an indigenous or native party voicing social protest, but a party controlled and manipulated by a foreign power.

Whether more extreme steps such as outlawing the Communist Party would be wise is something about which political leaders disagree. But fairly widespread public approval of outlawing the party has been found in the past.

A test of sentiment on the Communist issue was begun by the institute two days after the special session of Congress met on July 26. One question dealt with a major provision of the Mundt-Nixon bill, and another with the issue of the loyalty of American Communists. Results follow:

"The Mundt-Nixon bill now before Congress would not stop anyone from belonging to the Communist Party, but it would require every individual who belongs to the Communist Party or Communist organizations to register with the Justice Department in Washington. Do you think Congress should or should not pass this bill"

	Pct
Should	63
Should not	22
No opinion	15

"In general do you think most American citizens who belong to the Communist Party in this country are loyal to America or to Russia?"

	Pct
Loyal to U. S.	23
Loyal to Russia	56
No opinion	21

A separate survey was conducted on a variation of the above question with results as follows:

"If we should get into a war with Russia, do you think the Communists in the U. S. would help this country or would they try to work against the U. S.?"

	Pct
Would help U. S.	8
Would work against	73
Qualified ans.	4
No opinion	15

These doubts about loyalty undoubtedly explain why the majority of voters favor two other curbs on the American Communists.

More than two-thirds (67 pct) express the opinion that members of the Communist Party should be forbidden to hold civil service jobs in the government. An even larger proportion fear the damage that might be done by Communists in industries that would be important in wartime; hence 80 would favor steps to remove known Communists from such industries.

However, the American people are not in favor of railroading suspected Communists out of their jobs without a fair hearing.

In September, 1947, when loyalty tests for government employees were being discussed, a poll found that nearly seven voters in every ten (68 pct) thought that no government worker should be dismissed in loyalty purges without the right to a fair hearing on the charges and a chance to present his side of the case.

The issue of outlawing the Communist Party is one which has been debated for many years. In 1941, four days before Hitler's army invaded Russia, rudely terminating the Moscow-Berlin pact, the institute found that 71 pct of American voters thought membership in the American Communist Party should be forbidden by law.

Mundt-Nixon Provision For Registration of Communists Favored, Current Poll Shows

Six years later, after we had been allied to Russia in the fighting against Hitler, a new poll on the same question found that 62 pct still favored outlawing the party. The same percentage expressed the opinion that Communists in this country were actually taking orders from Moscow.

The spy testimony in Washington must hardly have come as any surprise to the general public. Two years ago, in August, 1946, an institute poll found that 78 pct, an overwhelming majority, believed Russia had spies at work then in the United States.

Doubts about the loyalty of Communists seem to be prevalent in other parts of the world too. In Sweden a poll in May by the Swedish Gallup organization found that most Swedes also think Communists in Sweden would side with Russia in a showdown:

The poll vote was:

"If Sweden should come into conflict with Russia, do you believe the Swedish Communists would be for Sweden or for Russia?"

	Pct
For Sweden	17
For Russia	55
No opinion	28

A religious element enters to some extent into the attitude of Americans toward Communists. A very substantial majority feel that the Communists would destroy the Christian religion if they could.

This was shown in a poll last October which found that 72 pct think the Communists are out to destroy Christianity.

Machine Toolmakers Emphasize Need for Labor Cost Reductio

• • • **The machine** tool industry, apostle of the reduction of production costs by means of labor saving mechanization, views each rise in labor rates as a major increase in its market. Plant production men everywhere are horrified at the last few years' rise in their labor costs and are openly welcoming the new production engineering type of salesman employed by some tool builders.

A few builders have gone so far as to offer production engineering studies on a large scale to their customers with a final recommendation that will include a guarantee of cost saving sufficient to recover the cost of the new equipment in a specified period of years when operating at or above minimum specified production rates. Such studies often result in the recommendation of a highly specialized multiple operation machine that can be supervised by a single operator. This equipment would replace a number of tools, each with its independent operator. Major savings in addition to manpower would include higher production rates, no handling of the work between operations and less floor space required for the combined operations.

Builders who are offering this type of service have had to be very careful as to their method of operation. Authority to begin a plant study of this nature is usually obtained from top management. But great pains are taken to work closely with the lower levels of operating executives so as to be sure that the recommendations made will have their approval and, if possible, their enthusiastic cooperation in urging their adoption.

There is no doubt that this type of engineering sales program will grow rapidly in the industry with today's high labor costs, the growing complexity of the machines needed to meet this problem and the impetus afforded by the tremendous capacity of the machine tool industry today.

In so far as possible, the machine tool industry has applied the principle of maximum mechanization to its own production operations. Wherever this has been possible on a large scale, price increases were held back until repeated increases in the prices of castings, bearing steels and motors forced action. However, many of the complex and specialized tools now in maximum demand are produced in small volume and require a degree of precision in critical parts that necessitates much careful individual attention.

New Production Engineering Type of Salesmen Being Welcomed by Some

An important cost cutting development is now being progressed by many tool builders that is expected to permit worth-while price reductions in many types of tools. An estimated 9 to 10 pct of the number of manhours required to build a machine is now devoted to filling and finishing operations on castings to obtain a perfect surface finish. During the war the time-honored cycle of snagging, cleaning, filling, rubbing and painting castings was dropped in order to promote maximum production with the available labor supply. The finish was very rough and made it difficult to clean oil and metal particles off the surfaces. Buyers demands made it necessary for the industry to provide a better surface finish on postwar machines.

The National Acme Co. is now in the early stages of production involving a dip finish which serves to fill the casting pores and needs no buffing before painting. Others are working with the Sherwin-Williams Co. on the development of a suitable filling technique that may be applied by brush and will prepare the surface for the priming coat of paint. When these developments go into the production line, it is certain that there will be important reductions in the prices of machines at no sacrifice of their fine surface finish.

Dealers are restive over the higher cost of their sales activiti without any corresponding increa in their revenues. At current hig er prices for machines, their co missions set on a percentage ba have increased somewhat. Ho ever, they point out that their sa costs have grown to more than do ble the prewar costs. Some rea justment of this compensation mu be worked out in the near future order to permit the dealers to r main solvent. It is observed in th connection that with every wa grant, there have been correspon ing increases in the field and off staffs of builders. Builders, ho ever, are expected to resist any i crease in the rate of compensati of their sales agents.

Marketwise, there were no fu ther developments during the wee Neither the rearmament progra nor the European recovery progra has begun to bring forth tool o ders. Automotive tool buying inactive and such important facto as General Motors and Chrysler a adhering to their established poli of no important changeovers models to require major purchas of machinery at this time. Deale report that August order volume about the same as July's. Augu shipments are down an estimat 10 pct, but it is believed that hea shipments during the last week the month should bring them up the previous level.

Builders are in a dither over t prospect of curtailed foundry pr duction due to the Kaiser-Fraz lease of the Republic Steel operat blast furnace in Cleveland.

New England machine tool bui ers are hamstrung with the p iron supply cut to a whisper by t closing of the Mystic Iron Wor for repairs, and Republic's notifi tion of stoppage of shipments fr the Cleveland government-own furnace. With the governmen utter failure to create dollar cre its in European countries needi machine tools and with domes buyers evincing little, if any, int est in equipment, the industry c lectively borders on the down a out.

Prices Steady; Some Shortages Alleviated

New York

• • Prices have intrenched themselves firmly on all grades in most sections of the country by this week, except in Boston where scrap was being sold at over-the-formula prices in enough cases to warrant quoting a spread of $34.40 to $36 for No. 1 heavy melting and $34.40 to $35 for No. 2 heavy melting, Nos. 1 and 2 bundles and bushelings.

The same strong demand continues as shipments generally move as they have during the last few weeks.

Two weeks ago Bethlehem took steps to augment the scrap they are receiving from the Pacific by signing a contract with the Western Steel Corp. for some of the allocated German scrap. This week Carnegie-Illinois Steel Co. made arrangements to also get a portion of the alloted tonnage to come to this country from Germany.

At the same time that the steel firms were making negotiations for foreign scrap, Luria Bros. were in the process of bringing appreciable tonnages to this country for sale on the open market. The first such boatload docked this week. This was reported in THE IRON AGE, Aug. 12, p. 133.

The cast iron grades have steadied during the past week and though they have appeared a little erratic in some places, prices are generally firm.

Some mills have been reported to have supplied themselves with an ample supply of scrap for the time being and are in beter shape than they have been for quite some time. On the other hand, there are mills who are as hard up as they have been for some time.

•

PITTSBURGH—With the exception of railroad scrap rails, which showed a 50¢ increase, all prices held firm in this area last week. Turnings, railroad specialties and low phos were reported extremely firm. There is pressure for higher prices on all these items. But consumers are unwilling to cross the formula barrier to obtain scrap. Movement of scrap was reported off a little from the level of the previous week. Vacations, hot weather and lack of substantial tonnages in yards were cited as reasons for the slower movement. Meanwhile, it was learned that Carnegie-Illinois Steel Corp. had completed purchase of a substantial tonnage—it may be as much as 200,000 tons—of prepared carbon steel scrap in Germany. Most of this scrap is expected to be delivered before the end of this year. Loading has already begun.

•

CHICAGO—Formula prices are continuing to hold here and the scrap flow is being maintained despite plant vacations and the recent hot weather. Reported withdrawal from the open market this week by a prominent mill buyer has been interpreted in some quarters either as an indication of a strong scrap position or assurance of a larger flow of earmarked material. Railroad lists closing this week continued strong with few items exhibiting any weakness.

•

PHILADELPHIA—Low phos plate and punchings edged up 50¢ this week to $50 to $51 as did heavy breakable cast in moving up to $61 to $62. All other prices remained substantially the same. Demand for scrap at most mills remained strong with shipments progressing normally. Some mills have succeeded in getting themselves in good shape as far as supply is concerned while others have not met with the same success. Several boatloads of German scrap are being unloaded for sale on the open market as was reported would be the case 3 weeks ago. This is entirely different scrap from the supply that is coming in to Sparrows Point from the Pacific, and which will come later from Germany.

•

CLEVELAND—The scrap markets here and in the Valley were relatively unchanged last week, except for a weakness in blast furnace grades caused when two mills stopped buying. Mill sources say that the metallic content of these grades was too low. Speculation on the effects of the Republic furnace deal are still rife, but so far they have not affected the market pricewise. Some factors believe that if the foundries should be cut off from their pig iron, which does not seem likely at this time, the cast market would drop sharply. According to this view foundry melts at present are using all the scrap they can take without building up their rejects. Therefore, they would have to cut back production. Others say that it is merely a question of the lower price of pig iron that makes them want to use all they can get and that in the past some foundry melts have been produced successfully with 100 pct scrap. Blast furnace prices in Cleveland and Youngstown are changed to reflect the weaker market. Mill inventories are good but quite inadequate to serve them over the winter.

DETROIT—The Detroit scrap market is quiet again this week, except for persisting reports of limited sales at higher-than-formula prices. Scrap flow has been surprisingly satisfactory, it is reported, and most cars appear to be well loaded. The cast iron market is a trifle firmer, it is reported. There are no present indications of a major upset in this market because of threatened loss of pig iron supply by a number of Detroit foundries.

•

BUFFALO—New orders for mill scrap were placed with local dealers last week at the formula by leading consumers quieting talk of another stalemate over prices. Previously there were intimations that dealers were dissatisfied with their old contracts and reports of covering at losses to clear the decks for battle. Leading mills also were reported paying only $37.25 for shoveling turnings which is the formula for mixed borings and turnings. Nearby consumers, however, were paying the equivalent of $38 Buffalo for shovelings. A total of 4500 tons of steelmaking scrap was in the barge canal enroute to Buffalo from the New York City area.

•

CINCINNATI—The market was very inactive in this district and there were no price changes. Most observers believe that there will be no reaction in this market on steel grades as the result of the Republic furnace deal. Foundry grades, however, are expected to reflect any developments that may occur in Cleveland and the Valley. Mill inventories are fairly good, and shipments are heavy. At current ingot rates, however, it has not been possible for the mills to build their winter inventories.

•

NEW YORK—There were no changes in prices this week. Shipments continued to move at what has been the normal rate for quite some time. Some consumers have had a tendency to tighten up on inspection, particularly on the bundled grades. Several consumers are better set on supply than they have been for some time while others are not in good shape. Chemical borings are moving a little better than they have in recent weeks due to release being given on old orders. The overall situation remains static.

•

BOSTON—Shipments are less frequent. Yard hoarding is becoming popular. Brokers talk new formula $34.40 steel, but the trade now quietly has $38 a ton in mind for No. 1 steel and $36 for No. 2. Others with tie-ins have gone in for nails, structurals and what not. Price is the $64 question this week. Cast, in small lots, is $65 to $70 a ton delivered greater Boston.

•

BIRMINGHAM—Scrap market continues active in Birmingham district with demand heavy for both cast and steel. Prices remain unchanged, although a shutdown of Sloss-Sheffield Steel & Iron Co. due to strike of coke oven workers may bring some increase if prolonged.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
RR. hvy. melting	43.50 to 44.00
No. 2 hvy. melting	42.50 to 43.00
RR. scrap rails	57.50 to 58.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	42.50 to 43.00
Hand bdld. new shts.	42.50 to 43.00
Hvy. axle turn.	44.00 to 44.50
Hvy. steel forge turn	44.00 to 44.50
Mach. shop turn	37.50 to 38.00
Shoveling turn.	39.50 to 40.00
Mixed bor. and turn.	37.50 to 38.00
Cast iron boring	39.50 to 40.00
No. 1 cupola cast	64.50 to 65.50
Hvy. breakable cast	55.00 to 56.00
Malleable	76.00 to 77.00
RR knuck, and cup	58.50 to 59.50
RR. coil springs	58.50 to 59.50
RR. leaf springs	58.50 to 59.50
Rolled steel wheels	58.50 to 59.50
Low phos.	49.50 to 50.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$41.50 to $42.00
No. 2 hvy. melting	41.50 to 42.00
No. 1 bundles	41.50 to 42.00
No. 2 dealers' bundles	41.50 to 42.00
Bundled mach. shop turn.	39.50 to 40.00
Galv. bundles	38.00 to 38.50
Mach. shop turn.	36.50 to 37.50
Short shov. turn.	38.50 to 39.50
Cast iron borings	38.00 to 40.00
Mix. borings and turn.	36.50 to 37.50
Low phos. hvy, forge	51.00 to 52.00
Low phos. plates	49.00 to 50.00
No. 1 RR. hvy. melt	44.25 to 48.50
Rerolling rails	62.25 to 67.75
Miscellaneous rails	61.00 to 62.00
Angles & splice bars	59.00 to 60.00
Locomotive tires, cut	60.00 to 61.00
Cut bolster & side frames	54.00 to 55.00
Standard stl. car axles	74.00 to 75.00
No. 3 steel wheels	57.50 to 58.00
Couplers and knuckles	57.00 to 57.50
Rails, 2 ft and under	64.00 to 67.00
Malleable	82.00 to 83.00
No. 1 mach. cast	74.00 to 75.00
No. 1 agricul. cast	68.00 to 70.00
Heavy breakable cast	63.00 to 65.00
RR. grate bars	67.00 to 68.00
Cast iron brake shoes	60.00 to 61.00
Cast iron car wheels	63.00 to 64.00

CINCINNATI

Per gross ton, f.o.b. cars.

No. 1 hvy, melting	$40.00 to $41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turn.	37.00 to 38.00
Cast iron borings	36.00 to 37.00
Mixed bor. & turn.	35.00 to 36.00
Low phos., 18 in. under	52.00 to 53.00
No. 1 cupola cast	66.00 to 68.00
Hvy. breakable cast	60.00 to 61.00
Rails 18 in. and under	63.00 to 65.00
Rails random length	57.00 to 59.00
Drop broken	71.00 to 72.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 heavy, melting	$34.40 to $36.00
No. 2 hvy, melting	34.40 to 35.00
Nos. 1 and 2 bundles	34.40 to 35.00
Busheling	34.40 to 35.00
Shoveling turn.	31.40 to 32.50
Machine shop turn	29.40 to 31.50
Mixed bor. and turn.	29.40 to 31.50
Cl'n cast chem. bor.	36.00 to 37.00
No. 1 machinery cast	64.00 to 65.00
No. 2 machinery cast	57.00 to 57.50
Heavy breakable cast	53.50 to 54.50
Stove plate	51.00 to 51.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	.... $33.00
No. 2 hvy. melting	.... 33.00
No. 1 bundles	.... 33.00
New busheling	.... 33.00
Flashings	.... 33.00
Mach. shop turn.	$32.50 to 33.00
Shoveling turn.	34.50 to 35.00
Cast iron borings	33.50 to 34.00
Mixed bor. & turn.	34.50 to 35.00
Low phos. plate	42.50 to 43.00
No. 1 cupola cast	56.00 to 59.00
Heavy breakable cast	51.00 to 54.00
Stove plate	53.00 to 54.00
Automotive cast	57.00 to 59.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.50 to $45.50
No. 2 hvy. melting	41.00 to 41.50
No. 1 bundles	44.50 to 45.50
No. 2 bundles	41.00 to 41.50
Mach. shop turn.	36.50 to 37.50
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn.	36.50 to 37.50
Clean cast chemical bor.	41.50 to 42.00
No. 1 machinery cast	65.00 to 66.00
No. 1 mixed yard cast	60.00 to 62.00
Hvy. breakable cast	61.00 to 62.00
Clean auto cast	65.00 to 66.00
Hvy. axle forge turn	46.00 to 47.00
Low phos. plate	50.00 to 51.00
Low phos. punchings	50.00 to 51.00
Low phos. bundles	47.00 to 48.00
RR. steel wheels	53.00 to 54.00
RR. coil springs	53.00 to 54.00
RR. malleable	75.00 to 78.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy, melting	$43.00 to $44.00
No. 2 hvy. melting	40.00 to 41.00
Bundled sheets	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Locomotive tires, uncut	50.00 to 51.00
Mis. std. sec. rails	52.00 to 54.00
Steel angle bars	54.00 to 55.00
Rails 3 ft and under	58.00 to 60.00
RR. steel springs	51.00 to 52.00
Steel car axles	56.00 to 57.00
Grate bars	59.00 to 60.00
Brake shoes	59.00 to 60.00
Malleable	72.00 to 73.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	65.00 to 67.00
Hvy. breakable cast	59.00 to 60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	.... $40.00
No. 2 hvy. melting	.... 40.00
No. 3 bundles	.... 40.00
No. 1 busheling	.... 40.00
Long turnings	27.50 to 28.50
Shoveling turnings	29.50 to 30.50
Cast iron borings	.... 29.00
Bar crops and plate	44.00 to 45.00
Structural and plate	44.00 to 45.00
No. 1 cupola cast	64.00 to 67.00
Stove plate	63.00 to 64.00
No. 1 RR. hvy, melt	.... 41.00
Steel axles	51.00 to 52.00
Scrap rails	44.00 to 45.00
Rerolling rails	55.00 to 57.00
Angles & splice bars	51.00 to 53.00
Rails 3 ft & under	52.00 to 55.00
Cast iron carwheels	50.00 to 55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to $43.00
No. 2 hvy. melting	42.50 to 43.00
Mach. shop turn.	37.50 to 38.00
Short shov. turn.	39.00 to 40.00
Cast iron borings	38.00 to 39.00
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy, melting	$38.50 to $39.00
No. 2 hvy. melting	.... 37.00
No. 2 bundles	.... 37.00
Mach. shop turn.	31.50 to 32.00
Mixed bor .& turn.	31.50 to 32.00
Shoveling turnings	33.50 to 34.00
No. 1 cupola cast	57.50 to 58.50
Clean auto cast	57.50 to 58.50
Hvy. breakable cast	56.00 to 57.00
Charging box cast	56.00 to 57.00
Unstrp motor blks	55.00 to 56.00
Cl'n cast chem. bor	36.50 to 37.50

BUFFALO

Per gross ton delivered to consumer

No. 1 hvy. melting	$46.00 to
No. 2 heavy, melting	41.75 to
No. 1 bundles	41.75 to
No. 2 bundles	41.75 to
No. 1 busheling	41.75 to
Mach. shop turn.	36.75 to
Shoveling turn.	37.25 to
Cast iron borings	37.75 to
Mixed bor. and turn.	36.75 to
Clean auto cast.	63.00 to
Mixed cupola cast	63.00 to
Charging box cast	59.00 to
Stove plate	62.00 to
Stove auto cast	60.00 to
RR. malleable	70.00 to
Small indi. malleable	47.00 to
Low phos. plate	47.25 to
Scrap rails	50.00 to
Rails 3 ft & under	57.00 to
RR steel wheels	51.00 to
Cast iron carwheels	51.00 to
RR. coil & leaf spgs	51.00 to
RR. knuckles & coup	51.00 to

CLEVELAND

Per gross ton delivered to consumer

No. 1 hvy. melting	$42.00 to
No. 2 hvy. melting	42.00 to
No. 1 bundles	42.00 to
No. 1 busheling	42.00 to
Drop forge flashings	42.00 to
Mach. shop turn.	37.00 to
Shoveling turn.	38.50 to
Steel axle turn.	42.00 to
Cast iron borings	37.50 to
Mixed bor. & turn.	36.50 to
Low phos. 2 ft and under	47.00 to
No. 1 machinery cast	72.00 to
Malleable	79.00 to
RR. cast.	76.00 to
Railroad grate bars	60.00 to
Stove plate	61.00 to
RR. hvy. melting	43.00 to
Rails 3 ft and under	63.50 to
Rails 18 in. and under	65.00 to

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	.... $
No. 2 hvy, melting	....
No. 2 bales	..
No. 3 bales	....
Mach. shop turn.	....
Elec. fur. 1 ft under	36.00 to
No. 1 cupola cast	50.00 to
RR. hvy, melting	....
Rails	....

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	... $
No. 2 hvy, melting	....
No. 1 bales	....
No. 2 bales	....
No. 3 bales	....
Mach. shop turn.	....
No. 1 cupola cast.	45.00 to
RR. hvy, melting	....

SEATTLE

Per gross ton delivered to consumer

No. 1 & No. 2 hvy. melt	.... $
Elec fur. 1 ft and under.	36.50 to
No. 1 cupola cast	40.00 to
RR. hvy, melting	....

HAMILTON, ONT.

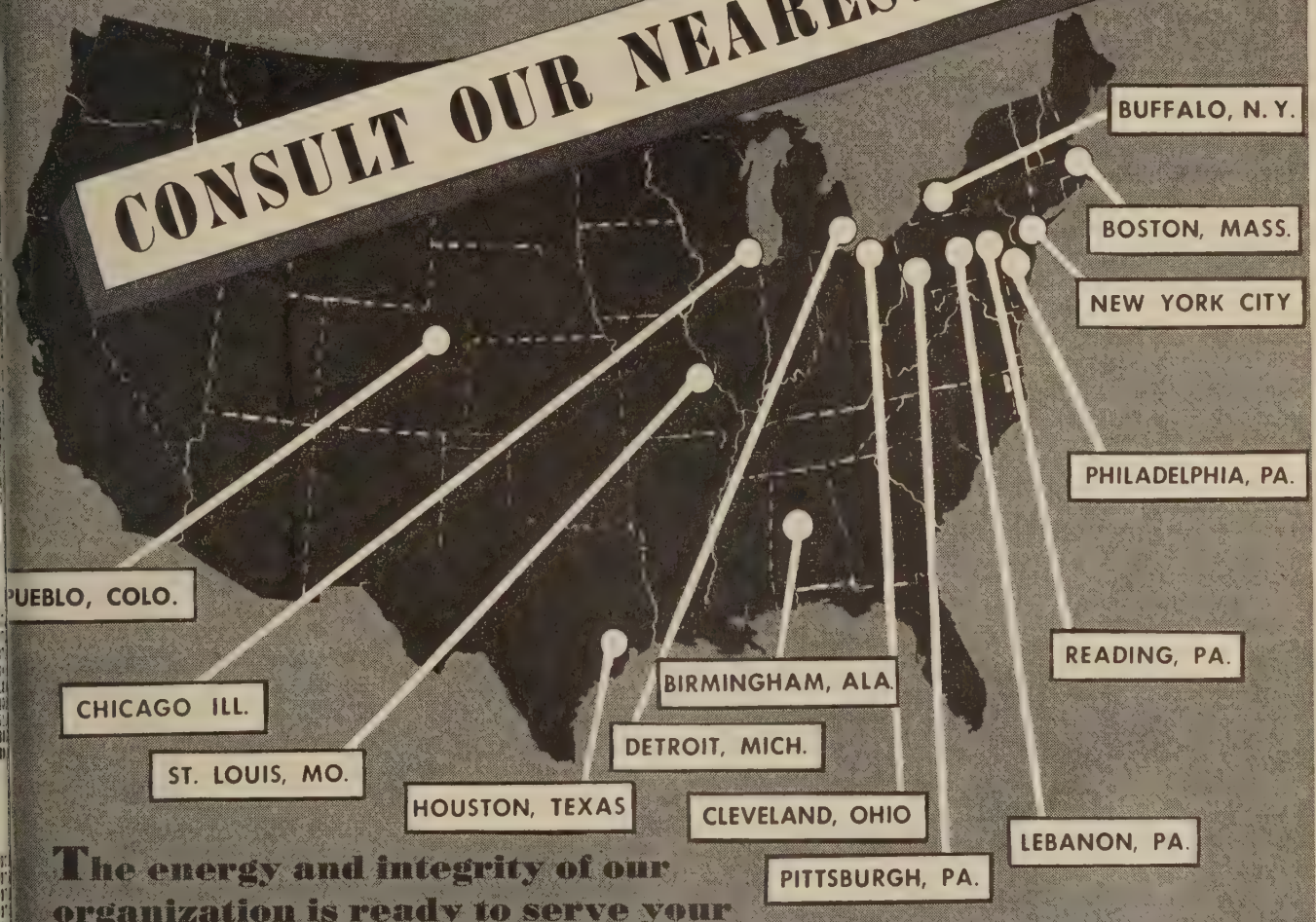
Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$2
No. 1 bundles	2
No. 2 bundles	2
Mechanical bundles	2
Mixed steel scrap	1
Mixed borings and turnings	1
Rails, remelting	2
Rails, rerolling	2
Bushelings	1
Bushelings, new fact, prop'd	2
Bushelings, new fact, unprep'd	1
Short steel turnings	1
No. 1 cast	42.00 to
No. 2 cast	35.00 to

*Ceiling Price.

For the Sale or Purchase of Iron and Steel Scrap...

CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests... Since 1889, Luria Bros. & Company, Inc. have made fair dealings their constant aim.

LURIA BROTHERS & COMPANY, INC.

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PHILADELPHIA 7, PENNSYLVANIA

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DETROIT, MICH. 2011 Book Bldg.
HOUSTON, TEXAS Cotton Exchange
LEBANON, PA. Luria Bldg.
NEW YORK, N. Y. Woolworth Bldg.
PITTSBURGH, PA. Oliver Bldg.
PUEBLO, COLO. Colorado Bldg.
READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

Board States Objectives For Strategic Material Stockpiling

New York

• • • **Detailed information** about the stockpiling objectives for strategic and critical materials was made public last week for the first time by the Munitions Board. This information covered only the objectives of the program during the present quarter ending on Sept. 30. No information was given on the tonnages already accumulated, and it is believed that such information will not be made public while the rearmament program is under way. So far no policy has been established for the regular release of stockpiling objective data on a quarterly or other basis.

Monthly Average Prices

• • • The average prices of the major nonferrous metals in August based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	23.434
Lake copper, Conn. Valley	23.625
Straits tin, New York	$1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Lead, St. Louis	19.30
Lead New York	19.50

This action was taken by the Munitions Board in an effort to avert any major inflationary effects on the strategic materials markets caused by uninformed speculation on the stockpiling objectives. It is a direct outgrowth of the recent major price increases in practically all nonferrous metals. There is some belief in the industry that had this action been taken at an earlier date, buying pressures on metals might now not have been built up to the point where such drastic price action would be necessary. Most factors recognize, however, that a more direct cause of the price increases was the strikes or the threat of strikes in major nonferrous metals coupled with unabated buying demand, and the latest round of wage grants.

Industry members consider that the release of information on the quarterly objectives of the stockpiling program will be inadequate without further information being made available on the size of the stocks of each metal now being held by the Munitions Board. However, the board is of the opinion that the objectives are well below estimates currently being made by well informed industry members and the press.

Rear Admiral Roger W. Paine, in charge of the stockpiling program as deputy executive chairman of the Munitions Board, left this post last week to become de inspector general, Bureau of S on the staff of the commande the western sea frontier. M General Sidney P. Spalding taken over his stockpiling fun as the board's director of mate and foreign trade. Rear Adm Francis C. Denebrink is now ac as the board's director of proc ment, manpower and utilities.

Objectives of the stockpiling gram for the current quarter some nonferrous metals are as lows:

Tin—4500 long tons.
Lead—16,000 short dry tons.
Copper—30,000 short tons.
Zinc—16,000 short tons.
Nickel—15,000,000 lb.
Cadmium—300,000 lb.
Chromite, metallurgical—30 long dry tons.
Chromite, reference type 1250 long dry tons.

Secondary Light Metals

• • • **The secondary** aluminum market is a little soft due to the summer decline and vacation shutdowns but the prices of most grades are remaining firm at previous price levels. Slightly lower prices prevail in the aluminum silicon alloy with 0.60 max. copper and in grade 4 deoxidizing aluminum. Most factors consider this a waiting period and expect to see a marked pickup in demand by Labor Day. They feel that the market can't do otherwise with the tight position in virgin ingot as long as general business conditions remain firm. Scrap aluminum prices are unchanged.

The magnesium market has improved markedly in the last 6 months reflecting the effects of the change in the outlook for the aircraft industry and the implementation of the 70-group air force. improvement in the magne market applies particularly to craft class alloys. Casting alo magnesium are now quoted in range of 20.00¢ to 21.25¢.

Remelted Brass, Bronze

• • • **One producer of** secon ingot, White Bros. Smelting C Philadelphia, is quoting on an plant basis, but so far as ca learned no other producer has lowed suit. Last week this com dropped its ingot prices by ½ 4¢ per lb as the result of the e position in red metals scrap. though there have been no l prices established in the scrap ket, the low level of demand ingots during the summer has reflected in the withdrawing o ingot makers from the ma Figures released on shipment ingots during July by the i brass and bronze industry ind a drop of 4000 tons from the vious month, down to 20,456 There is indication of better ment in August, but most indu members do not believe impr ment will be sufficient to cont scrap prices at present values.

Nonferrous Metals Prices

	Aug. 25	Aug. 26	Aug. 27	Aug. 28	Aug. 30	Aug. 31
Copper electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

Primary Metals

(Cents per lb, unless otherwise noted)

luminum, 99+%, 10,000 lb, freight allowed	16.00 to 17.00
luminum pig	1500 to 16.00
ntimony, American, Laredo, Tex.	35.00
eryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
eryllium aluminum 5% Be, dollars per lb contained Be	$40.00
admium, del'd	$1.90
obalt, 97-99% (per lb)	$1.65 to $1.72
opper electro, Conn. Valley	23.50
opper, lake, Conn. Valley	23.625
old, U. S. Treas., dollars per oz	$35.00
idium, 99.8%, dollars per troy oz.	$2.25
idium, dollars per try oz	$110 to $120
ead, St. Louis	19.30
ead, New York	19.50
agnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
agnesium, sticks, carlots	34.50
ercury, dollars per 76-lb flask, f.o.b. New York	$75 to $78
ickel, electro, f.o.b. New York	42.90
alladium, dollars per troy oz	$
latinum, dollars per troy oz	$93 to $96
lver, New York, cents per oz	73.25
in, Grade A, New York	81.00
nc, East St. Louis	15.00
nc, New York	15.65
rconium copper, 20 pct Zr, per lb contained Zr	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

-5-5-5 ingot	
No. 115	22.00
No. 120	21.50
No. 123	21.00
-10-10 ingot	
No. 305	27.25
No. 315	24.25
-10-2 ingot	
No. 210	33.00
No. 215	31.00
No. 245	25.75
ellow ingot	
No. 405	17.50
anganese bronze	
No. 421	23.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

-5 aluminum-silicon alloys	
0.30 copper, max.	26.50–27.50
0.60 copper, max.	26.25–26.75
iston alloys (No. 122 type)	24.25–24.75
o. 12 alum. (No. 2 grade)	23.50–24.00
8 alloy	23.50–24.25
5 alloy	23.50–24.50
alloy	26.00–27.00
XS-679	24.00–24.50
teel deoxidizing aluminum, notch-bar granulated or shot	
rade 1—95 pct.-95½ pct.	24.50–25.50
rade 2—92 pct–95 pct.	24.00–25.00
rade 3—90 pct–92 pct.	23.00–24.00
rade 4—85 pct–90 pct.	22.75–23.50

Electroplating Supplies

nodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

opper, ft. allowed	
Cast, oval, 15 in. or longer	40⅛
Electrodeposited	34⅜
Rolled, oval, straight, delivered	37.34
Rolled, oval, 18 in. or longer	35⅜
Ball anodes	30⅜
rass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	35⅞
inc, cast, 99.99	20.50
ickel 99 pct plus, frt. allowed	
Cast	59.00
Rolled, depolarized	60.00
admium	$2.00
ilver 999 fine	
Rolled, 100 oz lots per troy oz	67¼

hemicals

(Cents per lb, f.o.b. shipping point)

opper cyanide, 100 lb drum	46.00
opper sulfate, 99.5, crystals, bbls.	12.50
ickel salts, single or double, 425 lb bbls. frt. allowed	18.00
ickel chloride, 300 lb bbl.	24.50
ilver cyanide, 100 oz. lots, per oz	54.00
odium cyanide, 96 pct domestic 100 lb drums	16.00
inc cyanide, 10 lb drums	37.00
inc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.

Plate: ¼ in. and heavier; 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅝ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; ⅛ to 7/32 in., 32.5¢ to 53.5¢; 9/64 to ⅛ in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.

Screw Machine Stock: Drawn, ⅛ to 1½ in., 11S-T3, R317-T4, 48¢ to 34¢; cold-finished, ⅝ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ⅝ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1⅛ to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2½ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43c to 31c; 56S, 45.5c to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5c to 33c.; 75S-T6, 75¢ to 54¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in, 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to ⅝ $1.14; ⅝ to ⅞, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to ⅞, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78	....	37.18
Copper, hot-rolled	....	33.28	....
Copper, drawn	....	34.28	....
Low brass	38.07*	34.35	35.16
Yellow brass	36.76*	33.44	33.75
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass	....	28.30	....
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculoy, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct	....	46.42	44.20
Architectural bronze	....	....	32.33

* Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	21⅛	20⅜
Yellow brass	18	17⅛
Red brass	19¾	19
Commercial bronze	19¾	19
Manganese bronze	17¾	16⅞
Leaded brass rod ends	17¾	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	20.25-20.50
No. 2 copper wire	19.25
Light copper	18.25
Refinery brass	18.00-18.25*

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.

No. 1 copper, wire	19.25
No. 2 copper, wire	18.25
Light copper	17.25
No. 1 composition	16.50
No. 1 comp. turnings	16.25
Rolled brass	12.75
Brass pipe	12.50
Radiators	13.75
Heavy yellow brass	12.00
Aluminum	
Mixed old cast	11.50
Mixed old clips	11.50
Mixed turnings, dry	11.00
Pots and pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	18 — 18¼
No. 2 heavy copper and wire	17 — 17¼
Light copper	16 — 16½
Auto radiators (unsweated)	11¼ — 11¾
No. 1 composition	13¾ — 14
No. 1 composition turnings	13¼ — 13½
Clean red car boxes	10½ — 10½
Cocks and faucets	10¼ — 10½
Mixed heavy yellow brass	8¾ — 9¼
Old rolled brass	10¼ — 10½
Brass pipe	10¾ — 11
New soft brass clippings	13¼ — 14
Brass rod ends	11 — 11½
No. 1 brass rod turnings	10¼ — 10¾

Aluminum

Alum. pistons and struts	8 — 8½
Aluminum crankcases	10½—11
2S aluminum clippings	12 —12½
Old sheet & utensils	10½—11
Borings and turnings	5 — 5½
Misc. cast aluminum	10½—11
Dural clips (24S)	10½—11

Zinc

New zinc clippings	10 — 10½
Old zinc	7¾ — 8¼
Zinc routings	4 — 4½
Old die cast scrap	4½— 5

Nickel and Monel

Pure nickel clippings	19 — 20
Clean nickel turnings	15 — 16
Nickel anodes	18 — 19
Nickel rod ends	19 — 20
New Monel clippings	14 — 15
Clean Monel turnings	10 — 11
Old sheet Monel	12 — 12½
Old Monel castings	10 — 11
Inconel clippings	10 — 11
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½ — 7

Lead

Soft scrap lead	17 — 17½
Battery plates (dry)	11 — 11½

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	51 — 53
Mixed common babbitt	14¾ — 15¼
Solder joints	19¾ — 20¼
Siphon tops	50 —52
Small foundry type	20 —20½
Monotype	19 —19½
Lino. and stereotype	18 —18½
Electrotype	16½—17
New type shell cuttings	15 —15½
Hand picked type shells	6½— 7
Lino and stereo dross	9½—10
Electro dress	6½— 7

Comparison of Prices . .

Price advances over previous week are printe
Heavy Type; declines appear in *Italics.*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Aug. 31, 1948	Aug. 24, 1948	Aug. 3, 1948	Sept. 2, 1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.425	3.425	3.425	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stain's C-R strip (No. 302)	33.25	33.25	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.25	28.25	26.00	26.00
Wrought iron bars	9.50	9.50	9.50	7.15
Wire: (cents per pound)				
Bright wire	4.344	4.344	4.344	3.55
Rails: (dollars per 100 lb)				
Heavy rails	$3.20	$3.20	$3.20	$2.75
Light rails	3.55	3.55	3.55	3.10
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$52.00	$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†
Wire rod and Skelp: (cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Pig Iron: (per gross ton)	Aug. 31, 1948	Aug. 24, 1948	Aug. 3, 1948	Se
No. 2, foundry, Phila.	$49.26	$49.26	$46.76	$4
No. 2, Valley furnace	43.50	43.50	43.50	3
No. 2, Southern Cinti	48.14	48.14	48.14	3
No. 2, Birmingham	43.38	43.38	43.38	3
No. 2, foundry, Chicago†	43.00	43.00	43.00	3
Basic del'd Philadelphia	48.76	48.76	46.25	4
Basic, Valley furnace	43.00	43.00	43.00	3
Malleable, Chicago†	43.50	43.50	43.50	3
Malleable, Valley	43.50	43.50	43.50	3
Charcoal, Chicago	69.55	69.55	69.55	4
Ferromanganese‡	145.00	145.00	145.00	13

† The switching charge for delivery to foundries in the cago district is $1 per ton.
‡ For carlots at seaboard.
* Revised

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$42.75	$42.75	$42.75	$3
Heavy mlt'g steel, Phila.	45.00	45.00	45.00	3
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	3
No. 1, hy, comp. sh't, Det.	38.00	38.00	38.00	3
Low phos. Young'n	47.75	47.75	47.75	4
No. 1, cast, Pittsburgh	65.00	65.00	65.00	4
No. 1, cast, Philadelphia.	65.50	65.50	65.50	4
No. 1, cast, Chicago	74.50	74.50	74.00	4
Coke, Connellsville: (per net ton at oven)				
Furnace coke prompt	$13.50	$13.50	$13.50	$1
Foundry coke, prompt	17.00	17.00	17.00	1
Nonferrous Metals: (ccnts per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.215	2
Copper, Lake Conn.	23.625	23.625	23.625	2
Tin, Grade A, New York.	$1.03	$1.03	$1.03	$
Zinc, East St. Louis	15.00	15.00	15.00	1
Lead, St. Louis	19.30	19.30	19.30	1
Aluminum, virgin	16.00	16.00	16.00	1
Nickel, electrolytic	42.90	42.90	42.90	3
Magnesium, ingot	20.50	20.50	20.50	2
Antimony, Laredo, Tex.	35.00	35.00	35.00	3

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted fini steel index was revised for the years 1941, 1942, and 1943. See planation of the change on p. 90 of the Apr. 22, 1943, issue. I revised to a quarterly basis as of Nov. 16, 1944; for details p. 98 of that issue. The finished steel composite price for the rent quarter is an estimate based on finished steel shipments the previous quarter. This figure will be revised when shipm for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Aug. 31, 1948	3.75833¢ per lb.	$44.61 per gross ton	$43.16 per gross ton.
One week ago	3.75833¢ per lb.	$44.52 per gross ton	$43.16 per gross ton.
One month ago	3.75833¢ per lb.	$43.94 per gross ton	$43.16 per gross ton.
One year ago	3.18925¢ per lb.	$37.08 per gross ton	$37.83 per gross ton.

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1948	3.75902¢ July 27	3.22566¢ Jan. 1	$44.61 Aug. 31	$39.58 Jan. 6	$43.16 July 27	$39.75 Ma
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 Ma
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Ja
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 Ma
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oc
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.1
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.1
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Ap
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Ap
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 Ma
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 Ju
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 Ju
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 Ju
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Ap
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Se
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Ja
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 Ju
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 De
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 De
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 De

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy m steel scrap quotations to cons at Pittsburgh, Philadelphia and cago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only. (18) 0.20 to 0.50 carbon.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas.														
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Fr'isco, Los Angeles	Fontana
INGOTS Carbon forging	$50.00														
Alloy	$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling[12]	$52.00				$52.00	$52.00	(per net ton)						$52.00		
Carbon forging billets	$61.00	$61.00	$61.00	$61.00	$61.00	$61.00	(per net ton)						$61.00		
Alloy	$63.00	$63.00				63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren =3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70		3.40	4.05[13] 4.10[14]	
SHEETS Hot-rolled[6]	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95[15]	5.65
Cold-rolled[1]	4.00	4.00 to 4.25	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20			
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland =4.40			5.15[15]	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes[2] (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[3]	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 25	3.45		4.00 to 4.25	5.90
Cold-rolled[4]	4.00	4.25		4.00	4.00	4.00	4.00	4.00		New Haven 4.00 Warren = 4.00 to 4.25		4.20 to 4.50			7.10[18]
TINPLATE Cokes, 1.50 lb.[5] base box	6.80	6.80	6.80		6.90			6.90	6.90	Warren, Ohio = $6.80)				Pittsburg, Calif.—7.55	
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price														
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 coke base box price.														
BLACKPLATE, h.e., 29 ga.[10]	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.35	4.05 to 4.10	5.30
Reinforcing (billet)[7]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	5.30
Cold-finished[8]	3.95 to 4.00	4.00	4.00	4.00			4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon = 3.75					3.75	4.80[14]	5.50
Alloy, cold-drawn								Massillon = 4.65							
PLATE Carbon steel[11]	3.40 to 3.60	3.40	3.40	3.40	3.40	3.45	3.40	Coatesville = 3.75, Claymont = 3.95 Geneva, Utah = 3.40, Harrisburg — 5.85				3.65	3.45	4.30[16]	5.80
Floor plates	4.55	4.55		4.55											
Alloy	4.40	4.40							Coatesville = 5.10						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem = 3.30, Geneva, Utah = 3.25						3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE[9] Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.50	4.25	Duluth = 4.15 Worcester = 4.45				4.15	5.10[13]	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. producing point

Product	Chromium Nickel			Straight Chromium		
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging	25.25—27.75	24.75—24.50	19.25—21.50	19.25—21.75	23.00	28.00—30.25
Bars, hot-rolled	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Bars, cold-finished	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Plates	34.75—34.00	32.50—32.00	25.75—26.00	26.50	30.75	36.25—35.50
Shapes, structural	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Sheets	43.00—39.50	40.75—37.50	32.00—33.00	34.75—35.50	39.00	43.50—50.00
Strip, hot-rolled	28.00—27.75	25.75	20.25—21.25	21.00—21.75	28.50	41.75—45.00
Strip, cold-rolled	35.75—35.00	33.50—33.00	26.50—27.00	27.00—27.50	38.50	62.25—60.00
Wire, cold-drawn	29.25—30.00	28.50	22.50—23.00	23.00—23.50	27.00	33.00—32.50
Wire, flat, cold-rolled	35.75	33.25	26.25	26.75	38.25	62.00
Rod, hot-rolled	29.75	28.50	22.00	22.50	26.75	31.75
Tubing, seamless	79.25	79.25	.....	75.25	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00
8 to 16	48, 60, 72	14.50
7	48, 60	15.75
6	48, 60	17.00
4, 5	40	17.50
3	40	18.50
2½	24, 30	19.00
2	24, 30	21.00
Carbon		
40	100, 110	6.75
35	65, 110	6.75
30	65, 84, 110	6.75
24	72 to 104	6.75
17 to 20	84, 90	6.75
14	60, 72	7.25
10, 12	60	7.50
8	60	7.75

TOOL STEEL

F.o.b. mill

W	Cr.	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium ..... 52¢
Oil harden manganese ..... 29¢
Special carbon ..... 26.5¢
Extra carbon ..... 22¢
Regular carbon ..... 19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base all grades f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95 to 6.15
Motor	6.90 to 7.20
Dynamo	7.50 to 7.90
Transformer 72	8.05 to 8.90
Transformer 65	8.60 to 9.60
Transformer 58	9.30 to 10.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb $3.20
Joint bars, 100 lb 4.25
Light rails (from billets) per 100 lb 3.55

	Base per lb
Cut spikes	5.35¢
Screw spikes	8.00¢
Tie plate, steel	4.05¢
Tie plates, Pittsburg, Calif.*	4.20¢
Track bolts	7.50¢
Track bolts, heat treated, to railroads	8.50¢

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon..... 4.00¢
0.41 to 0.60 carbon..... 5.50¢
0.61 to 0.80 carbon..... 6.10¢
0.81 to 1.05 carbon..... 8.05¢
1.06 to 1.35 carbon..... 10.35¢
Worcester, add 0.30¢

CLAD STEEL

Base princes, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b.		
Coatesville, Pa.	*27.00	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	7.75

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCT

To the dealer, f.o.b. mill

	Base Colu Pitt Co
Standard & coated nails*	103
Galvanized nails*	103
Woven wire fence†	109
Fence posts, carloads††	114
Single loop bale ties	106
Galvanized barbed wire**	123
Twisted barbless wire	123

* Pgh., Chi., Duluth; Worcester, 6 umns higher. † 15½ gage and hea
** On 80 rod spools, in carloads. †† Du only.

	Base per 100 lb	*Pitt C*
Annealed fence wire‡	$4.80	$5
Annealed, galv. fencing‡	5.25	6
Cut nails, carloads‡	6.75	

‡ Add 30¢ at Worcester; 10¢ at S rows Pt. (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

mill prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethle-hem	Jones & Laughlin	Youngs-town Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.20	5.20	5.20	5.65
Sheets									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled	6.05	6.05	6.05	..	6.05	6.05	6.05	6.05	6.35
Galvanized	..	6.75		....	....	6.75	....	....	....
Strip									
Hot-rolled	4.95	4.95	4.95	....	4.95	4.95	4.95	4.95	5.25
Cold-rolled	....	....	6.05	....	....	6.05	6.05		6.35
Shapes	....	4.95	....	....	4.95	4.95	4.95		....
Beams	....	4.95	....	....		....	....	....	....
Bars									
Hot-rolled	5.10	5.10	5.10	....	5.10	5.10	5.10		5.40
Bar shapes	....	5.10	....	....	5.10	5.10	5.10		

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. mills, steel buttweld and seamless. Base price, $200.00 per net ton.

ndard, threaded and coupled

l, buttweld*	Black	Galv.
n.	46	26½
	48½	29½
in.	49	30
in.	49½	30½
	50	31
and 3-in.	50½	31½
ught Iron, buttweld		
n.	+20½	+50
n.	+10½	+39
d 1¼-in.	+ 4½	+30
	— 1½	+26½
	— 2	+26
l, lapweld		
	39½	20
and 3-in.	43½	24
to 6-in.	45½	26
l, seamless		
	38½	19
and 3-in.	41½	22
to 6-in.	43½	24
ught Iron, lapweld		
	+ 7½	+34
to 3½-in.	+ 5	+29½
	list	+23½
to 8-in.	+ 2	+25

tra Strong, plain ends

l, buttweld		
d.	41	22
n.	45	26
	47	29
in.	47½	29½
in.	48	30
	48½	30½
and 3-in.	49	31
ught Iron, buttweld		
n.	+16	+44
n.	+ 9½	+37
2 in.	— 1½	+26
l, lapweld		
	38½	20
and 3-in.	43½	25
to 6-in.	45½	26
l, seamless		
	37½	19
and 3-in.	41½	23
and 6-in.	45	26½
ught Iron, lapweld		
	+ 4½	+30½
to 4-in.	— 5	+19
to 6-in.	— 1	+23½

asing discounts for standard pipe are threads and couplings. For threads , buttweld, lapweld and seamless , one point higher discount (lower e) applies. For plain ends, buttweld, eld and seamless pipe 3-in. and ller, three points higher discount er price) applies, while for lapweld seamless 3½-in. and larger four ts higher discount (lower price) ap- s. F.o.b. Gary prices are one point r discount on all buttweld. On butt- and lapweld steel pipe, jobbers are nted a discount of 5 pct. On l.c.l. ments, prices are determined by add- 25 pct and 30 pct and the carload ht rate to the base card.

F.o.b. Fontana prices average 17 ts lower discount (higher price) on k, 14 points on galvanized.

BOILER TUBES

amless steel and electric welded commer- boiler tubes and locomotive tubes, minimum Prices per 100 ft. at mill in carload lots, length 4 to 24 ft. inclusive.

Gage	Seamless		Electric Weld	
n. BWG	H.R.	C.R.	H.R.	C.D.
13	19.18	22.56	18.60	21.89
½ 12	25.79	30.33	25.02	29.41
12	28.68	33.76	27.82	32.74
½ 11	35.85	42.20	34.78	40.94
10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

Per net ton

24-in., del'd Chicago.....$106.70
24-in., del'd N. Y.....103.50 to 108.40
24-in., Birmingham..... 93.50
. and larger, f.o.b. cars, San ancisco, Los Angeles, for all il shipment; rail and water ipment less 120.30
ass "A" and gas pipe, $5 extra; 4-in. is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter..	35
9/16 & ⅝ in. x 6 in. & shorter.....	37
¾ in. & larger x 6 in. & shorter....	34
All diam, longer than 6 in.....	30
Lag, all diam over 6 in. longer.....	35
Lag, all diam x 6 in & shorter.....	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller.....	35
9/16 to 1 in. inclusive.....	34
1⅛ to 1½ in. inclusive.....	32
1⅝ in. and larger.....	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller.....	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.....	37	..
1⅛ in. through 1½ in. ...	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate.....	61.75
In bulk	70.00

Large Rivets

(½ in. and larger) Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller) Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright.....	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	
Milled studs	19
Flat head cap screws, listed sizes....	5
Fillister head cap, listed sizes.....	28

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%.....	34.00
60% but less than 65%.....	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags.....	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe...	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe....	90.0¢ to $1.75
Aluminum	24.00¢
Antimony	47.67¢
Brass	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	33.75¢
Cadmium	$2.55
Chromium, electrolytic, 99% min.	$3.50
Lead	26.00¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	67.00¢
Nickel, spherical, minus 30 Mesh, unannealed	61.00¢
Silicon	29.0¢
Solder powder .....8.5¢ plus metal cost	
Stainless steel, 302.....	75.0¢
Tin	$1.15
Tungsten, 95%, 99%.....	$2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$12.50 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $18.00
Foundry, Byproduct	
Chicago, del'd	$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	17.86

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	*Carloads, Per* 1000
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add $5).....	$80.00
No. 1 Ohio.....	74.00
Sec. quality, Pa., Md., Ky., Mo.....	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50).....	11.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.....	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.....	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)....	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00

Magnesite Brick

Standard, Balt., and Chester.....	$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

Std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester, in bulk, fines removed.....	$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines.....	$30.50 to 31.00
in sacks with fines.....	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢.....$11.85

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Philadelphia	$5.15-5.71	$6.31-6.57	$7.27-7.47	$5.35-5.66	6.51	$5.37-5.50	$5.09-5.20	$5.35-5.6[illegible]	$6.16-6.26	$9.14	$9.29	$10.54	$10.[illegible]
New York	5.40-5.98	6.28[1]-6.43[1]	7.25-7.54	5.58-5.88	6.73	5.78	5.32-5.58	5.53-5.63	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.[illegible]-10.[illegible]
Boston	5.48-5.64	6.39	7.58-7.69	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.59	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.[illegible]-11.[illegible]
Baltimore	5.28	6.18	7.15-7.38	5.34	....	5.53	5.33	5.39	6.13	....	....	.....	.....
Chicago	4.85	5.75	6.95-7.05	4.85	6.15	5.10	4.90	4.90	5.70	9.00	9.15	10.40	10.[illegible]
Milwaukee	5.02-5.07	5.92	7.12-7.22	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.[illegible]-10.[illegible]
Cleveland	4.98-5.20	5.75[1]-6.04[1]	7.18-7.24	5.02-5.65	6.70	5.35-5.54	5.16-5.42	5.15-5.34	5.70-5.95	9.14-9.29	9.29-9.79	10.54	10.[illegible] .....
Buffalo	4.85-5.10	5.75-5.85	7.55-7.70	5.55-5.56	6.35	5.45-5.46	5.10	5.15-5.20	5.90-6.05	9.05-9.35	9.40-9.50	10.75	10.[illegible]
Detroit	5.20-5.55	6.15-6.50	7.45	5.25-5.70	6.25-6.55	5.50-5.55	5.30-5.37	5.30-5.52	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.[illegible]-11.[illegible]
Cincinnati	5.14-5.36[8]	5.82-6.21[8]	6.97-7.45	5.25-5.62[8]	....	5.50-5.71[8]	5.30-5.47[8]	5.30-5.62[8]	6.06-6.17[8]	9.31-9.35	9.50-9.51	10.75-10.78	10.[illegible]-10.[illegible]
St. Louis	5.19	6.04-6.09	7.29-7.39	5.19-5.79	6.49	5.38-5.44	5.24	5.24	6.04	9.34	9.49	10.74	10.[illegible]
Pittsburgh	4.35-4.90	5.75[1]	6.95-7.05	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.00	9.15	10.40	10.[illegible]-10.[illegible]
St. Paul	5.41	6.31	7.30-7.61	5.41	....	5.66	5.46	5.46	6.26	9.56	9.71	10.96	11.[illegible]
Omaha	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	....
Birmingham	5.05[11]	6.36	6.45	5.05[11]	6.36	5.25[11]	5.00[11]	5.00[11]	6.51	....	....	.....	.....
Houston	6.40	....	8.80	6.75	....	6.35	6.20	6.40	7.60	9.80	9.65	10.75	10.[illegible]
Los Angeles	6.30-6.40	7.85[1]-7.90	7.95-8.55	6.60-6.66	9.35[5]	5.95-6.10	5.75-5.90	6.05	7.85[15]-7.95	10.35[15]	10.20[15]	11.75[15]	11.[illegible]
San Francisco	5.95[8]	7.15	7.65	6.40[8]	....	6.30	5.90	5.90	7.55	10.35[15]	10.20[15]	11.75[15]	11.[illegible]
Portland	6.35[4]	7.85[2]	8.30[2]	6.70[4]	...	6.15[4]	6.10[4]	6.10[4]	8.10[14]	....	10.30[15]	....	12[illegible]
Seattle	6.20[4]-6.30[4]	7.75[2]-7.85[2]	7.65-8.00	6.55[4]-6.65[4]	....	6.20-6.30	6.15-6.25	6.05[4]-6.15[4]	8.00[14]-8.10[14]	....	10.30[15]-10.40[15]	....	12[illegible]-12[illegible]
Salt Lake City	6.15-7.05	...	8.30-8.45	7.10-7.35	....	5.75-6.40	6.65-6.80	6.95-7.25	7.55-8.15	....	....	.....	...

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 800 to 4999 lb; (4) 800 to 9999 lb; (5) 2000 lb and over; (6) 100 and over; (7) 400 to 14,999 lb; (8) 400 lb over; (9) 500 to 1999 lb; (10) 500 to 999 (11) 400 to 3999 lb; (12) 450 to 3749 lb; 400 to 1999 lb; (14) 1500 lb and over; 1000 to 4999 lb; (16) 4000 lb and over; up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pc on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	44.00	44.50	45.00	45.50	.....
Birmingham	42.88	43.38	.....	.....	.....
			.....	.....	.....
Buffalo	44.00-47.00*	44.00-47.00*	44.50-47.50*	.....	.....
Chicago	43.00	43.00	43.50	44.00	.....
Cleveland	43.00	43.50	43.50	44.00	48.00
Duluth	43.00	43.50	44.00	44.50	.....
Erie	42.50	43.00	43.50	44.00	.....
Everett	...	48.75	49.25	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....
Provo	43.00	43.50	.....	.....	.....
Sharpsville	43.00	43.50	43.50	44.00	.....
Steelton	44.00	44.50	45.00	45.50	50.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	42.50	43.00	43.50	44.00	.....
Troy, N. Y.	.....	.....	....	.....	50.00
Youngstown	43.00	43.50	43.50	44.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	L Ph
Boston	Everett	$0.50 Arb.	.....	48.75	49.25	.....	...
Boston	Steelton	6.27	50.27	50.77	51.27	51.77	56
Brooklyn	Bethlehem	3.90	47.90	48.40	48.90	49.40	...
Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	...
		.....	.....	.....	.....	.....	...
Jersey City	Bethlehem	2.39	46.39	46.89	47.39	47.89	...
Los Angeles	Provo	6.93	49.93- 50.43	50.43	.....	.....	...
Mansfield	Cleveland-Toledo	3.03	45.53-46.03	46.03-46.53	46.53	47.03	...
Philadelphia	Bethlehem	2.21	46.21	46.71	47.21	47.71	...
Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	...
Philadelphia	Steelton	2.81	46.81	47.31	47.81	48.31	52
San Francisco	Provo	6.93	49.93	50.43	.....	.....	...
Seattle	Provo	6.93	49.93	50.43	.....	.....	...
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	...

* Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as sh in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —$56.50; f.o.b. Buffalo—$57.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for pct or more P. Bessemer ferrosilicon p are $1.00 per ton above silvery iron price comparable analysis.

Charcoal pig iron base price for low phorus $62.00 per gross ton, f.o.b. Tenn. Delivered Chicago, $69.55. High phorus charcoal pig iron is not being duced.

rromanganese

8-82% Mn, Maximum contract base ce, gross ton, lump size, f.o.b. Baltire, Phila., New York.....$145
.b. Birmingham $150
.b. Niagara Falls, Alloy, W. Va., Weland, Ont. $145
rload lots (bulk) $145
.b. Rockwood, Tenn.....$150
ss ton lots (packed).....$189
.b. Etna, Pa. $148
1.80 for each 1% above 82% Mn; nalty, $1.80 for each 1% below 78%. Briquets—Cents per pound of briquet, ight allowed, 66% contained Mn.

	Eastern	Central	Western
rload, bulk ...	8.70	8.95	9.50
n lots	10.30	10.90	12.80
ss ton lots	11.20	11.80	13.70

iegeleisen

Contract prices, gross ton, lump, f.o.b. mmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
rloads	$56.00	$57.00
.b. Pittsburgh..	55.00	56.00

nganese Metal

Contract basis, 2 in. x down, cents per nd of metal, f.o.b. shipping point, ight allowed, eastern zone.
6% min. Mn, 0.2% max. C, 1% max. 2% max. Fe.

rload, bulk	32
l. lots	34

ctrolytic Manganese

.o.b. Knoxville, Tenn., freight allowed st of Mississippi, cents per pound.

loads	32
n lots	34
ss ton lots	36

w-Carbon Ferromanganese

Contract price, cents per pound Mn conned, lump size, f.o.b. shipping point, ight allowed, eastern zone.

	Carloads	Ton	Less
7% max. C. 0.06% , 90% Mn.	23.00	24.85	26.05
0% max. C.	22.50	24.35	25.55
5% max. C.	22.00	23.85	25.05
0% max. C.	21.50	23.35	24.55
0% max. C.	21.00	22.85	24.05
5% max. C., .00% max. Si.	18.00	19.85	21.05

icomanganese

Contract basis, lump size, cents per nd of metal, f.o.b. shipping point, ight allowed, 65-70% Mn, 17-20% Si, % max. C.

load bulk	7.80
n lots	9.45
quet, contract, basis, carlots, bulk reight allowed, per lb of briquet	8.75
n lots	10.35
ss ton lots	11.25

very Iron (electric furnace)

1 14.01 to 14.50 pct., f.o.b. Keokuk, openhearth $81.00, foundry, $82.00; .75 f.o.b. Niagara Falls; Electric furce silvery iron is not being produced at kson. Add $1.00 per ton for each adional 0.50% Si up to and including . Add $1.00 for each 0.50 pct Mn over pct.

icon Metal

Contract price, cents per pound conned Si, lump size, f.o.b. shipping point, ight allowed, for ton lots packed.

	Eastern	Central	Western
% Si, 2% Fe..	16.90	17.50	18.10
% Si, 1% Fe..	17.30	17.90	18.50

icon Briquets

Contract price, cents per pound of quet, bulk, f.o.b. shipping point, freight wed to destination, 40% Si, 1 lb Si quets.

	Eastern	Central	Western
load, bulk ...	5.25	5.50	5.70
n lots	6.85	7.45	7.75
ss ton lots ...	7.75	8.35	8.65

ctric Ferrosilicon

Contract price, cents per pound conned Si, lump size in carloads, f.o.b. pping point, freight allowed.

	Eastern	Central	Western
% Si	16.50	....	....
% Si	9.30	9.80	10.00
% Si	11.80	12.10	12.85
% Si	13.30	13.60	14.35
% Si	15.00	15.30	16.00

lcium Metal

Eastern zone contract prices, cents per und of metal, f.o.b. shipping point, ight allowed. Add 1.5¢ for central e; 3.5¢ for western zone.

	Cast Turnings	Distilled
n lots $1.85	$2.70	$3.40
ss ton lots 2.20	3.05	4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	25.00
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ...	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots....	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

..Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots ...	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C. ..	97.00	98.50	99.75
0.50% max. C. ..	93.00	94.50	95.75
9.00% min. C. ..	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
30-35% Ca, 60-65% Si, 3.00% max. Fe
Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.35	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.

Ton lots	14.60¢
Less ton lots	15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9%, Ca 5%.

Ton lots	17.90¢
Less ton lots	19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... $2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth	$2.90
Crucible	3.00
High speed steel (Primos).....	3.10

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5 ..... $1.20

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb

Ton lots	$2.50
Less ton lots	$2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 95¢

Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo..... 80¢

Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo..... 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti $1.23

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti $1.35
Less ton lots $1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton....$152.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload..... $75.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Carload lots ..... 18.40¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.
Carload, bulk ..... 6.00¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	7.20¢
Ton lots	7.70¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots	10.50
Ton lots	11.25

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Ton lot	$1.20	$1.21	$1.23

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots.	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots...	$1.80	$1.81	$1.84

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
Carload lots ..... 39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	93¢
No. 6	63¢
No. 79	45¢

Bortam, f.o.b. Niagara Falls

Ton lots, per pound.....	45¢
Less ton lots, per pound.....	50¢

Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
Ton lots, per pound..... 8.625¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B..... $6.25

OIT Sets Third Quarter Quotas For Over Forty Of Nonferrous Products

Washington

• • • **Third quarter** export quotas for more than 40 nonferrous metal products have been set by the Office of International Trade. The quotas presented below include all presently approved requirements of various special projects "of vital interest to the United States," OIT explained.

With the exception of batteries and freight cars, all commodity amounts are shown in short tons. The nonferrous products and amounts approved are as follows: Refined copper, bus bars only, 50; old and scrap copper, 1000; copper pipes and tubes, 4000; copper plates, sheets and strips, 2500; copper rods, 1000[1]; copper wire, bare, 2750[1]; copperweld wire, 250; rubber-covered wire, except lamp cord, 3000[1]; weatherproof wire, 1000[1]; other insulated copper wire, 5500[1]; brass and bronze, scrap and old, 7500[2]; brass and bronze ingots, 5000[2]; brass and bronze bars, rods, and unfinished shafting, 5000; brass and blanks, plates, sheets and strips, bronze circles, 5000; brass and bronze pipes and tubes (include pipe coils), 5000; brass and bronze pipe fittings, 500; brass and bronze wire, bare and insulated, 3000; bronze structural shapes, brass and bronze castings and forgings, 400.

Lead pigs and bars (include blocks and ingots), 500[3]; lead sheets and pipes (include bends), 500; lead solder, 200[4]; type metal (antimonial lead), 1000; lead anodes, 100; lead foil and lead-tin foil, 50; lead plate or battery plate, not assembled as complete battery units, 1000; lead scrap and residues, 1000; lead castings, caulking yarn, circles, disks, flanges, plugs, powder, rings, metal packing rings, roof flanges, sash weights, scale weights, shots, shrapnel, sinkers, strips, tape, washers, weights, wire, wool, 200; tin tubes, 4[5]; tin metal in ingots, pigs, bars, blocks, slabs and other forms, 20.

Zinc cast in slabs, pigs, or blocks: special high grade, containing not over .007 pct lead, not over .005 pct iron, not over .005 pct cadmium, no aluminum, and at least 99.99 pct zinc; high grade, containing not over .07 pct lead, not over .02 pct iron, not over .07 pct cadmium, no aluminum, and at least 99.99 pct zinc; intermediate, containing not over .20 pct lead, not over .03 pct iron, not over .50 pct cadmium, no aluminum, and at least 99.50 pct zinc; brass special, containing not over .60 pct lead, not over .03 pct iron, not over .50 pct cadmium, no aluminum, and at least 99.00 pct zinc; selected, containing not over .80 pct lead, not over .04 pct iron, not over .75 pct cadmium, no aluminum, and at 98.75 pct zinc.

Prime western, containing over 1.60 pct lead and not over pct iron; other zinc cast in s pigs or blocks, 2000[6]; babbit m 300[7]; antimony (include metal regulus, needle or liquidated mony, alloys and antimony-bea scrap metal), 100; cadmium m (include metallic shapes), copper alloys in primary forms cept brass, bronze, nickel or 500; type (include multig type), 200; batteries, storag and 12 v, include aircraft, aut tive, and radio batteries and k down assemblies, 200,000; freight cars, over 10 ton capa 1200.

NOTE

1 Copper rods, and copper wire, of origin will be licensed without quota tion.
2 Tin content not to exceed 5 pct.
3 Lead manufactures produced from imports of lead or lead ore will be li without quota restriction.
4 Tin content not to exceed 80 short to
5 Licenses will be issued against this only for tin tubes to be used for medicinal and pharmaceutical purpo accordance with ODC Order M-43.
6 Zinc in slabs, pigs, or blocks "in bo produced from zinc in bond" will be li without quota restriction.
7 Tin content not to exceed 108 short to

Declares Dividend

Cleveland

• • • **Directors of the** Clev Graphite Bronze Co. have dec a dividend of 40¢ a share on mon stock and the regular qua ly dividend of $1.25 a share on ferred stock.

Mass Producing 15-Ton Bulldozers

(CONTINUED FROM PAGE 86)

lengthwise, it positions the bores for the two semi-automatic heads which machine the bores on the sides of the case. Two similar semi-automatic heads were built for machining the front and rear of the case. These four special heads operate a total of 12 spindles, seven of which are operated in one head, two sets of paired spindles, and one single spindle unit.

These are hydraulically operated lathe heads, composed of a frame, drive gears, and special spindles. The frames for the units were fabricated from heavy steel plates and form a somewhat standardized semi-automatic lathe head that is used for most of the semi-automatic machines built in the plant.

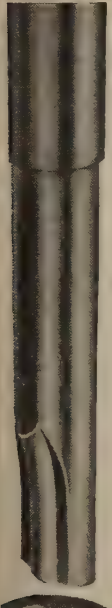
The spindles, which are 22-in. long, 11½-in. OD, and 8-3/16 in. ID, were made from cannon barrel stock left in the wake of World War II, a very effective salvage of war material for productive purposes.

The electric motors for the driving of these separate heads were made by the LeTourneau Corp. at the Peoria Plant, an especially designed motor for heavy duty loads such as encountered in this type of machining. A total of 38 separate cutting tools are involved in the tooling for this single case boring mill unit.

The special semi-automatic lathe shown in fig. 9 was built for the production of special parts. It has a hydraulically operated feed and uses two semi-automatic heads; and is of especially rugged construction, so that high speeds and heavy cuts may be accomplished in the production of large quantity o bearing cage which it mach One head turns and faces the inal forging and simultaneousl other head bores and faces the of the forging. This is essen a two stage operation, two sep parts being machined at the time in the same machine, so each cycle of operation pro one complete part.

Numerous similarly speci machines have been built fo chining other special parts. building of a special machine vides the ideal chucking, ho processing, and standard pr tion of these parts without th pensive modification of a stan ized machine tool which pro would have cost as much or than the special machine tool for the purpose.

TYPE "A" ASSEMBLY BIT



COMMON SCREWDRIVER

THE INSIDE STORY OF CLUTCH HEADS

Here It Is, showing *what* goes on inside the Clutch recess, and *why* . . . why users testify so freely that CLUTCH HEAD has features not matched by any other screw on the market for safety, speed, and savings.

Visibility a Speed Factor. The wide, roomy Clutch invites operator confidence. Saves "breaking-in" period. Presents an easy-to-hit target for stepped up production.

No Driver Canting to chew up heads and create a skid hazard. The Center Pivot Column on the Type "A" Bit guides the driver into the mating recess formation. Deep dead-center entry and straight driving become automatic.

Safe, Effortless Drive-Home. Note straight sides of the driver matching straight walls of the Clutch recess. Contact is all-square on a broad pressure area for positive torque grip and non-tapered driving.

No Ride-Out to Combat. This feature disposes of "kick-out" as set up by tapered driving . . . the commonest cause of driver slippage. The screw rides home easily without the application of fatiguing end pressure.

Lock-On Breaks "Bottlenecks". A reverse turn of the bit in the recess unites screw and driver as a unit for easy one-handed reaching to hard-to-get-at spots. Normal driving of the screw releases the Lock-On.

Sample screws and Type "A" Bit sent on request

"Outlasts Other Bits 5 TO 1"

The rugged structure of this Type "A" Bit logically explains this testimony. Also, a 60-second application of the end surface to a grinding wheel repeatedly restores it to original efficiency. No expense. No delay.

CLUTCH HEAD SCREWS

Simplifies Field Service

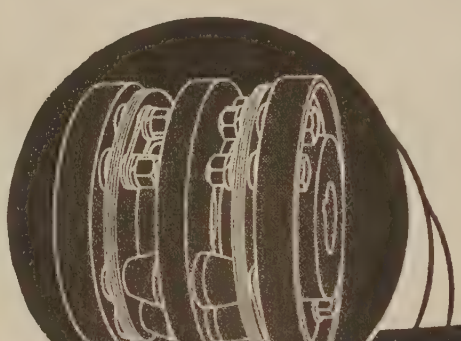
This is the only modern screw basically designed to operate with an ordinary screwdriver. With a Type "A" hand driver, the Lock-On feature permits the withdrawing of screws undamaged and held safely for re-use.

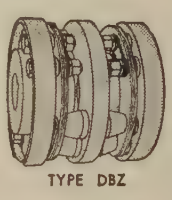
UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

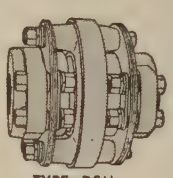
THOMAS *Flexible* COUPLINGS

....are specified by engineers, wherever 100% Operating Efficiency is demanded





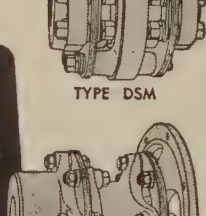
TYPE DBZ



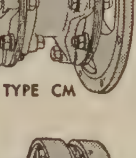
TYPE DSM

THOMAS *Flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float... *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

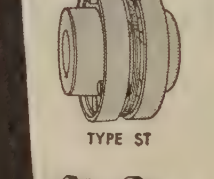
NO LUBRICATION IS REQUIRED!



TYPE CM

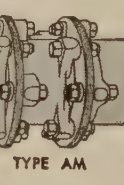


TYPE ST

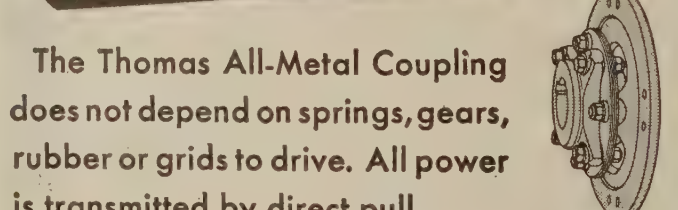


TYPE AM

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.



TYPE SS



WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

——— PERSONALS ———

(Continued from page 112)

• **R. J. Thompson** has been r manager of engineering and at the Burbank, Calif. pla Ampco Metal, Inc. He for held the position of general manager.

• **A. P. Heiner** has been r assistant to the vice-presiden general manager of the iron steel division. Kaiser Co. In charge of public relations, wi headquarters in Oakland, Mr. Heiner, who has been wit Kaiser company for the pa years as general traffic ma retains general supervision o department in addition to hi duties.

• **Howard B. Barr** has been moted to the position of tra manager for Columbia Stee San Francisco. Mr. Barr has associated with the industrial tions department of the cor since 1945.

• **C. S. Brach** has been name and price manager of the Sp ities division of the Yale & Mfg. Co., Salem, Va. Mr. joined the Stamford divisi Yale & Towne in 1928. Previ his new appointment he serv sales correspondent in the sp ities sales department.

• **Harry C. Taylor** has re joined the operating staff at Iron Co., Jackson, Ohio, as furnace superintendent.

• **John F. Wilson** has bee pointed to act as senior re representative in the Buffalo for American Machine & Fo Co., in the absence of the president in charge of oper of the company's Pinspotters sion. In his new post, Mr. will have the title of assistan eral manager of the Pinsp division.

• **C. Bayard Johnson** has bee moted to executive vice-pre Woodall Industries, Inc., D **Gerhard E. Kasch** and **Wal Skinner** have been appointed managers.

• **A. F. Westerfield,** sout branch manager, has bee pointed to serve as special ant to the president and man, U. S. Radiator Corp., D

• **John R. Bergan** has bee pointed merchandising mana the newly-formed departme ordinating advertising, me

PERSONALS

ng and sales promotion, Minne-lis-Honeywell Regulator Co., neapolis. **Chandler Murphy** has n promoted to advertising man-r and **John A. Young** to sales motion manager.

Robert O. Blackford has been ned advertising and sales pro-ion manager of Michigan Ab-ve Co., Detroit.

John T. Kiley has been named nager of the Boston division of James Flett Organization, Inc., ceeding **Miss L. G. Wonnacott,** has retired. Mr. Kiley formerly d the position of manager of Hodgkins & Co.

D. B. Higgins has been appointed eral depot manager of the parts l accessories division of Ford or Co., Dearborn.

John P. McWilliams has been ted chairman of the board, ngstown Steel Door Co., Cleve-d. **Harold H. Henricks** has been ned president to succeed Mr. Williams.

Frederick J. Ellis has been med assistant merchandising nager, Pumps and Compressor es, Worthington Pump & Ma-nery Corp., Harrison, N. J. For-rly assistant manager of Recip-ating Pumps Sales Div., Mr. Ellis ned Worthington in 1916 and ved successively in the firm's of-s in Washington, Denver, De-t, Cincinnati, Holyoke, Mass. l in Harrison.

Richard J. Sheridan has retired president of the John B. Astell , New York. **John B. Astell** has n named president.

James Boyd, formerly eastern trict manager of the Westing-use Electric Corp., has been ap-nted general sales manager of Lima-Hamilton Corp.'s Hamil- Div., New York.

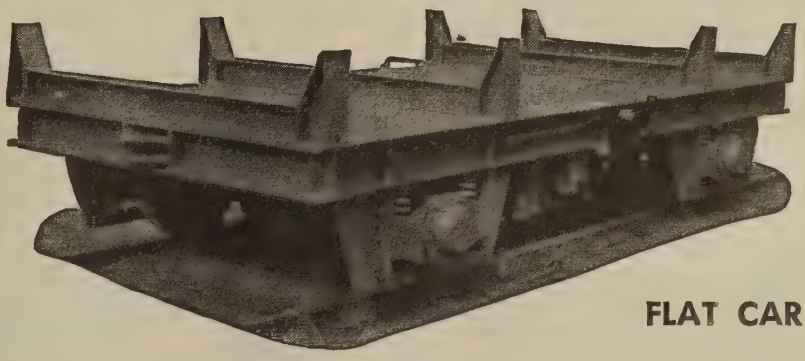
Lester G. Sigourney has retired general sales manager of New parture division of General Mo-s Corp., Bristol, Conn. Mr. Si-rney joined the company 40 rs ago as a timekeper. Three rs later he became associated h the sales department and was r made assistant sales manager l then general sales manager. 1922 he was appointed secretary l director of the New Departure g. Co. **Frank J. Miller** has been ointed to succeed Mr. Sigourney. Miller has been in charge of

ATLAS

INTRA-PLANT HAULAGE EQUIPMENT

SPEEDS PRODUCTION
LOWERS COSTS

40 TON

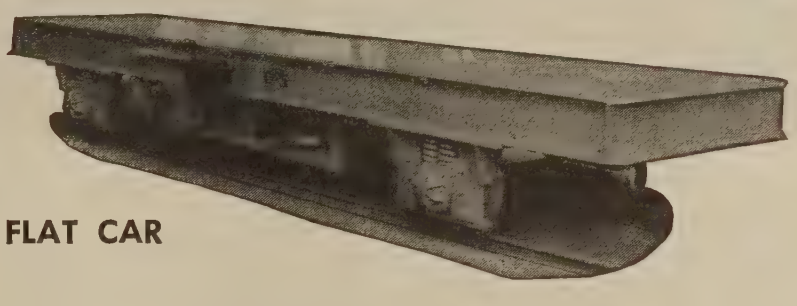


FLAT CAR

STORAGE BATTERY POWERED

Car equipped with triple reduction drive to one axle. Magnetic brake on motor armature shaft and controller arranged to return to "off" position automatically. Car also arranged to haul a similar trailer on level track.

20 TON



FLAT CAR

STORAGE BATTERY POWERED

This car has triple reduction spur gear drive and travels at walking speed when controller is held in operating position. When control handle is released, car stops automatically.

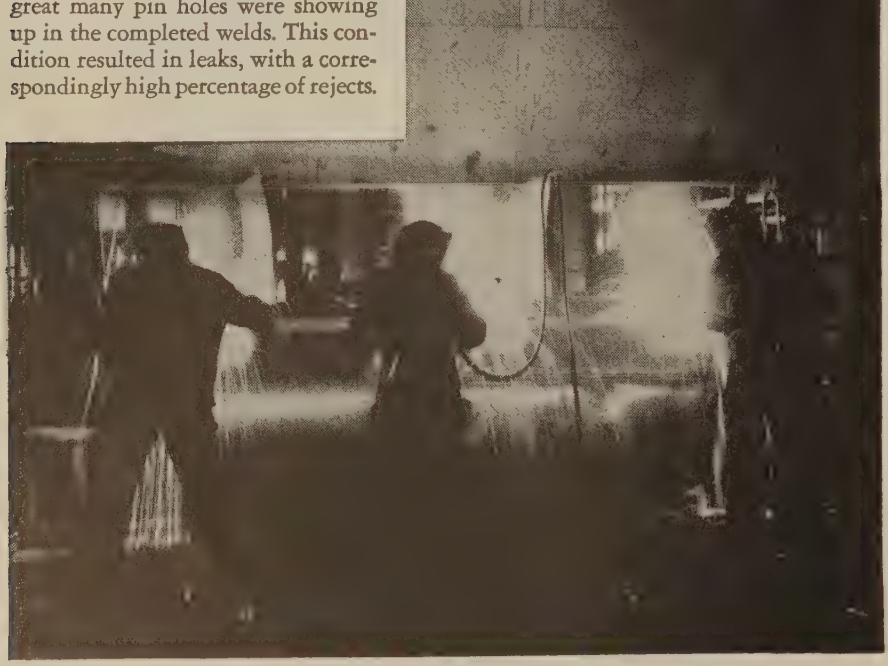
ATLAS builds intra-plant haulage equipment designed and engineered to your needs.

ATLAS ENGINEERING SERVICE
ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Weld pin-holes eliminated ...gas tanks now leakproof

A well-known Southern metal fabricator had trouble welding gasoline storage tanks. They found that a great many pin holes were showing up in the completed welds. This condition resulted in leaks, with a correspondingly high percentage of rejects.



H. J. Korner, Airco Technical Sales Representative suggested switching to Airco No. 78E electrodes — a high quality electrode for all-position welding. He recommended continuing their already established production procedure: two 45", 14-gauge galvanized steel sheets are rolled into two cylinders 40" in diameter. These are mounted on power-driven, revolving rolls, and welded both longitudinally and together, forming a 90" cylinder. At each end flanged heads are welded into position, completing the tank. 467 linear inches are welded, and the entire operation is completed in 38 minutes. The No. 78E electrode completely eliminates pin holes, and resulting leaks.

• • • •

TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

Technical Sales Service — though not a packaged commodity — is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Address Dept. IA -8750, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

AIRCO **AIR REDUCTION**

Offices in all principal cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

——— PERSONALS ———

the New Departure Chicago for 11 years. He joined the Ch office in 1919. **William T. Mu** assistant general sales ma for the last five years, has transferred to Meriden, Con resident manager of the divi plant in that city.

• **Conda P. Boggs** has been e president of Victor Electric ucts Inc., Cincinnati, a subs of L. W. Maxson Corp. Mr. has resigned as vice-preside Sylvania Electric Products In assume his new duties.

• **David A. Utiger** has beer pointed sales manager of the Div., Howes-Woods Co., Camb Mass. Mr. Utiger has formerly associated with Capewell Mfg

• **Robert A. Anderson** has bee pointed Chicago sales repres tive of Ingram-Richardson Co., Beaver Falls, Pa., and Ing Metals Products Co., East Pal Ohio. Mr. Anderson has for been associated with the Ing steel division of Borg-Warner

• **C. F. McGinnis** has beer pointed assistant sales mana the Ridgway Div., Elliott Co., nette, Pa. Mr. McGinnis has with Elliott since 1936. He ha in the electric power departm Ridgway and has also been ager of the Kansas City offi fore returning to Ridgway las

• **Robert J. Stein,** assistant tary and assistant treasurer, Aluminum Alloys, Inc., Dayto been appointed sales represen for the State of Michigan, wi headquarters in Detroit.

• **William G. Zink** has bee pointed manager of the Seatt trict of the automotive, av and government division of F. Goodrich Co., Akron, Ohi Zink has been with the comp years. He has been assistan trict manager of the division Angeles for the last two years **mar F. Homer** has been sales representative in the York district and **Gerald A. erici,** sales representative i Dayton district. **H. F. Mille** been made production mana plants of the B. F. Goodrich ical Co., with headquarte Cleveland. Formerly manag Plant 3 in Akron, Mr. Mille been with the company sinc **H. B. Warner** has been

PERSONALS

ant manager of Avon Lake ex-rimental station. Mr. Warner ned the company in 1939 and ce early this year has been serv-g as assistant to the vice-presi-nt, manufacturing, in Cleveland.

C. Hands who has been produc-n manager of Plant 3 since 1943, places Mr. Miller as plant man-er. Mr. Hands joined the com-ny in 1935.

Ray D. Cunningham has been pointed manager of the protec-e coatings department, sales vision, Lion Oil Co., El Dorado, k.

F. H. Lukas and **J. R. Carter** have en appointed to the public rela-ns staff of the Crosley division, co Mfg. Corp., Cincinnati, Mr. cas managing the newly-in-lled Crosley photographic sec-n and Mr. Carter, publicity as-nments and Crosley news.

Martin L. Ingwerson has been pointed superintendent of the erican Shipbuilding Co.'s Buf-o drydock. Mr. Ingwerson for-rly held the position of assistant perintendent of Great Lakes En-eering Co.

Captain Harry L. Dodson, USN etired) has been appointed man-er of the Quick Repair Yard of ondale Marine Ways Inc., on the racoastal Waterway at Harvey,

Morgan B. Lawton has been ap-nted manager of Lincoln Lubri-ing Systems Inc., Cleveland, in dition to his duties as manager Lincoln Engineering Co.'s sales nch in Detroit. **Warren Kline** s been made assistant manager Lincoln Lubricating. Mr. Kline s been associated with Lincoln gineering for the past 12 years.

William B. Brooks has been med research and development ineer for Dow Chemical Co., eport, Texas. Mr. Brooks was merly consulting metallurgist in sburgh.

Walter W. Kemphert has been ted vice-president in charge of es for Skilsaw, Inc., Chicago. Mr. nphert was formerly associated h Worthington Pump & Ma-nery Corp., Harrison, N. J. **J. J. olinski** works manager of Skil-, has been elected vice-presi-t in charge of manufacturing. Topolinski has been with the n since 1932, serving successively production manager, superin-dent, and since 1943, as works nager.

ENGINEERING B-W PRODUCTION

● **No—this** isn't mathematical tomfoolery. It's simply that IngAclad—with its 20% cladding of solid stainless steel—provides 100% stainless protection against rust, corrosion, abrasion and erosion *on the contact side.* Which, in scores of applications in the process industries, is all that's required.

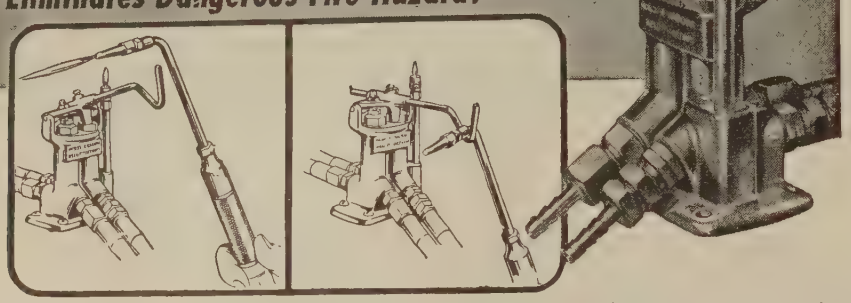
With an 80% backing of mild steel, IngAclad *costs substantially* less than solid stainless. What's more, it's *easier*—hence, *less expensive*—to fabricate.

Find out all about IngAclad *now.* Learn how it may be the answer to your stainless steel requirements. No obligation. INGERSOLL Steel Division, Borg-Warner Corporation, 310 South Michigan Avenue, Chicago 4, Illinois. Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan.

INGACLAD
STAINLESS-CLAD STEEL

WELDIT GASAVER

● Cuts Gas and Oxygen Cost!
● Eliminates Dangerous Fire Hazard!



With Weldit Gasaver installed the operator simply hangs his torch on the handy lever rod of the Gasaver. The weight of the torch pulls the lever rod down, closing the valves of the Gasaver, thus shutting off both gas and oxygen intake lines. The usual idle flame and needless waste of oxygen and gas between operations is thus eliminated—no fire hazard or danger of injury to workers.

When the torch is again picked up for further welding operations, the operator passes it across the pilot light of the Gasaver, thereby instantly igniting the torch at the pre-adjusted flame, ready for work—no adjustments to make.

Gasaver can be installed any convenient place on the line between regulators and torch. Most of America's largest production plants are now Gasaver equipped.

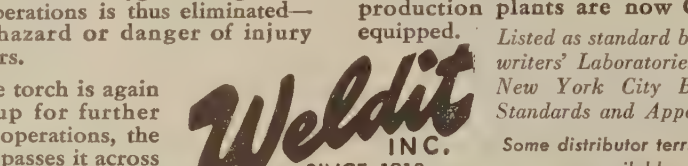
Listed as standard by Underwriters' Laboratories and by New York City Board of Standards and Appeals.

Some distributor territory still available.

Weldit INC.
SINCE 1918

992 OAKMAN BLVD. • DETROIT 6, MICH.

A WATCH OR A PRINTING PRESS



NEEDS PERMANENT ALIGNMENT

and GRAND RAPIDS GRINDERS
deliver continuous micro-accuracy*

The micro-accuracy of Grand Rapids Grinders comes, in part, from Gallmeyer & Livingston's unique method of making massive, one-piece column and base castings of close-grained gray iron . . . achieving vibrationless rigidity and permanent alignment between cross-travel ways and vertical head ways.

Other assurances of long-life accuracy in Grand Rapids Grinders include: patented vertical head adjustment; flanged type, pre-loaded ball bearing spindle; and the fastest longitudinal table speed available in any grinder.

*Accuracy within 0.00025 limits

To serve you—*Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.*

GALLMEYER & LIVINGSTON COMPANY

GRAND RAPIDS GRINDERS

200 STRAIGHT AVE., S.W., GRAND RAPIDS 4, MICHIGAN

$32 Million Contract To New York Firm fo Passenger Cargo S

Washington

• • • **Award of** a $32 million tract to the New York Shipbui Corp., Camden, N. J., for the struction of three combin passenger-cargo vessels fo round-the-world service of A can President Lines, has been nounced by the Maritime Com sion.

The ships will be built at corporation's Camden shipyard will provide an estimated 75 man-days of work for a mini of 2 years.

The New York Shipbui Corp.'s successful bid was $10,07 on an adjusted basis for each o three vessels. The Maritime mission has approved a cons tion-differential subsidy to A can President Lines of 44.05 p the entire contract, under auth of the Merchant Marine Act of This represents the difference tween the estimated cost of b ing the vessels in this country the cost of building them ab In addition, the government pay for national defense fea built into the vessels.

Notice of the APL award fo closely the commission's anno ments last week that a $50 m contract had been awarded Bethlehem Steel Corp. for the b ing of two passenger ships American Export Lines, and bids had been requested on a posed 980-ft super-liner for Lines. These will also be built construction-differential subs granted by the commission u its existing legislative authorit

Hunter Gives Refresher Courses for Engin

Lansdale, Pa.

• • • **Two-day courses** for d engineers who have occasio work with spring design, toler and specifications will be held at the Hunter Spring Co. on a nate weeks starting Aug. 31, ac ing to Knowlton D. Montgo president of the company.

The course will include de strations of tolerance comp tions, open forums and discuss plant visits and six lectures

ic spring design, checking of ng specifications, controlling test load, spring materials and sses, inspection and testing hods.

---

ctor Receives ACS Midwest Award for Treatment of Anemia

Louis

• **Dr. Paul L. Day** of the Uni- ity of Arkansas, whose pioneer arch led to the discovery of min M for the treatment of nicious anemia, has won the 3 Midwest Award of the St. Louis tion of the American Chemical iety, it was announced recently. Day, who is head of the Bio- mistry Dept. in the University Arkansas School of Medicine. receive the gold medallion rd at a special ceremony in Jefferson Hotel on Sept 5, in nection with the opening of the west Session of the 114th na- al meeting of the society.

addition to the American mical Society, Dr. Day is a nber of the American Medical n., the Public Health Assn. and r scientific organizations.

evious winners of the Midwest rd have been Dr. Lucas P. Ky- s, formerly organic research ctor of the Monsanto Chemical St. Louis; Dr. Carl F. and Dr. ty T. Cori, professors at the hington University School of icine, who last year shared in Nobel Prize in medicine, and Anderson W. Ralston of the mour Research Laboratories, cago.

---

ne European Countries Need Guidance in Labor

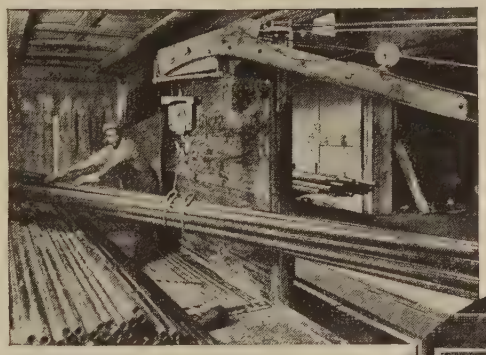
tington, W. Va.

• **There is need** for skilled kers in Europe and also need American assistance to industry ome of the countries there in development of craftsmen, ac- ing to William F. Patterson, ctor of apprenticeship, U. S. t. of Labor.

r. Patterson's views are based information that he obtained a recent trip to France, Italy Greece for use by the Labor t. in its foreign aid activities. llowing are his recommenda- s to our government: Arrange- ts should be made to send rep-

96 MAN HOURS CUT TO 32— WITH BAKER TRUCK

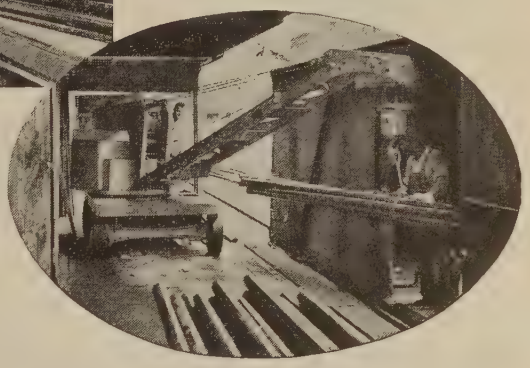
Crane Truck at NATIONAL ACME CO. pays for itself in 8 months



This Baker Crane Truck, unloading 20 ft. steel tubes each weighing 260 lbs., cuts man hours by 2/3 over former methods. Actual savings — as shown in tables below — are even greater than estimates made before the truck was purchased:

(Above) Boom of Baker Crane truck leaving box car with load of ten 2¾" x 20 ft. steel tubes.

(Right) Baker Crane Truck loading tubes onto trailer. Each tube weighs 260 lbs., load weighs 2600 lbs.



Man Hours per car — Previous Methods

96 MAN HOURS

Remove blocking from car	0.5 hrs. x 4 men	2.0
Unload to trailer 100,000 lbs.	11.0 hrs. x 4 men	44.0
Clean car	0.5 hrs. x 4 men	2.0
Haul to storage Unload from trailer to pile Return empty trailer	12.0 hrs. x 4 men	48.0
Total man hours		96.0

Estimated Man Hours with Baker Truck

45 MAN HOURS

Remove blocking from car	1.0 hrs. x 2 men	2.0
Unload to trailer 100,000 lbs.	11.0 hrs. x 2 men	22.0
Clean car	1.0 hrs. x 2 men	2.0
Haul to storage Unload from trailer to pile Return empty trailer	9.5 hrs. x 2 men	19.0
Total man hours		45.0

Actual Man Hours with Baker Truck

32 MAN HOURS

Remove blocking from car	0.5 hrs. x 2 men	1.0
Unload to trailer 100,000 lbs.	7.0 hrs. x 2 men	14.0
Clean car	0.5 hrs. x 2 men	1.0
Haul to storage Unload from trailer to pile Return empty trailer	8.0 hrs. x 2 men	16.0
Total man hours		32.0

A Baker Material Handling Engineer can show you how to make similar savings

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Co.
2175 WEST 25TH ST. CLEVELAND, OHIO
In Canada: Railway & Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

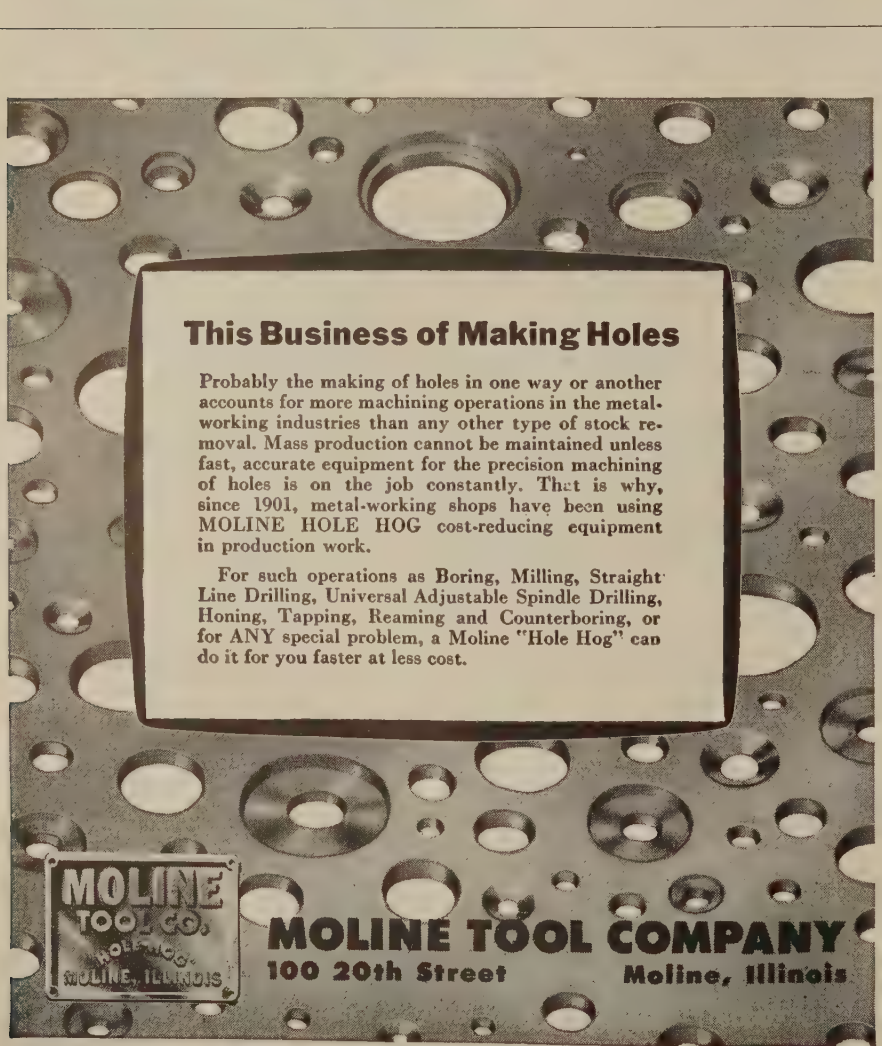
THOMAS STRAIGHT SIDE PRESSES

FORMING - DRAWING
BLANKING
PIERCING

can be done with these up-to-the minute presses. They combine modern structural design with the usual Thomas inbuilt ruggedness and dependability. Wide range of sizes and capacities. *Write for Bulletin 307.*

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

7



resentatives to some of the
pean countries to act as advis
their governments and to both
management and labor in he
to improve management and
relations through apprentice

Training of workers sent t
country in skilled arts and
would be of aid to their cou
when they return.

It would be helpful to these
tries to send their labor le
here to see and study how our
organizations function.

"This program would prov
dual purpose in that besides p
ing aid to these countries, it
also tend to offset much o
false propaganda which fills
section of Europe about the p
and government of the U
States," he concluded.

ASTE Will Move to Own Building No

Detroit

• • • **Its own building** to
the activities and central off
the American Society of Tool
neers has become a reality.
has been a major goal of the
nical society for the past 3 y

Construction of the new qu
is now under way and the
will move its headquarters fro
Penobscot Bldg. to the new e
by Nov. 1, according to an
nouncement by I. F. Holland
tional president of the socie

Mr. Holland declared, "Since
it has grown to a membersh
more than 18,000 men in and
ated with 76 local chap
throughout the United State
Canada. The activities of th
ciety, while still directed a
original goal of education, hav
panded to such an extent th
felt it necessary to have our
building for efficient operatio

Mr. Holland mentioned the
for more than double the ar
of space to carry on the soc
normal functions. Most of all,
ever, he emphasized the proj
expansion of ASTE activities i
fields of standards, public rela
education, publishing and the
dling of professional problem
lating to the field of tool engi
ing.

The building program is
financed largely by a special
of 4½ pct investment bonds
are being sold only to ASTE

rs and members of the society. he entire issue of $110,000 has een almost completely subscribed. The enterprise is being directed y special housing and finance ommittees. A. M. Sargent, of Deoit, heads the Housing Committe with W. B. Peirce, Grant S. ilcox and Harry E. Conrad, exutive secretary, as members. embers of the Finance Committe, ades the chairmanship of R. H. orris of Hartford, are H. L. Tigges, V. Briner, G. A. Goodwin, nation- treasurer, W. B. Peirce and A. M. argent.

WAA Announces More Midwestern Plants to Be Sold or Leased

hicago

• • **WAA has announced** a list 12 additional plants for sale or ase in Illinois, Wisconsin, Michian and Minnesota, in its drive to spose of all remaining surplus ants in the next 6 months, when ongress has decreed it must go ut of business.

The government surplus plant ferings for the first time include operties now under lease, which ay be purchased subject to the ases. Four general manufacturing ants, which are now in operation y private industries under leases nning to 1950 and 1951, are inuded in the 12 properties being fered. The other eight surplus ants are offered for either sale or ase.

The 12 plants offered are: Genal manufacturing plant, Muskeon, Mich., wartime operator was ontinental Aviation & Engineerg Corp.; general manufacturing ant, Galesburg, Ill., wartime opator was Commodity Credit Corp.; eneral manufacturing plant, Deoit, wartime operator was Contiental Motors Corp.; industrial failities with dock, Seneca, Ill., artime operator was Chicago ridge & Iron Co.; foundry, Bay ity, Mich., wartime operator was ow Chemical Co.; brass casting nd rolling plant, Chicago, wartime perator was Revere Copper & rass Co.; industrial subdivision for ght and heavy manufacturing, arysville, Mich., wartime operator as Dow Magnesium Corp. also eneral manufacturing plant, Milaukee, wartime operator, A. O. mith Corp.; general manufacturg plant, Chicago, for sale subject

A NEW EQUATION *in* PRODUCTION PROFITS

CONSTANT SURFACE ROUGHNESS is the key to substantial savings in progressive plants throughout the country.

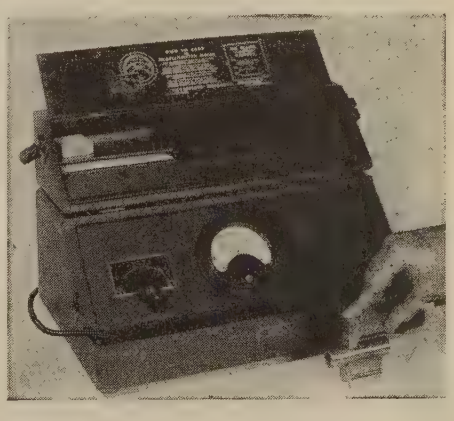
Modern roughness control enables parts to be brought more rapidly to final size and finish—often with fewer operations. It saves time in setting up for duplication of previous jobs on both long and short runs. It permits impending *dimensional* errors to be detected *before they occur,* so that such errors can be prevented and rejects eliminated. And by no means incidentally, it improves the quality of product.

The closeness of control required cannot be obtained by visual inspection; for differences in reflectivity, lay of the grind or curvature of the work prevent accurate comparison with roughness specimens. Inspection by "feel" is likewise subject to serious human error.

To eliminate errors of judgment—to obtain the dependable accuracy of measurement essential to effective control—more and more companies are using the Profilometer as a regular part of their quality-control equipment.

The Profilometer gives *definite, accurate and consistent microinch readings.* It is ruggedly built for shop use, and is portable—can be used wherever most convenient. It will measure practically any surface that can be produced by machining, grinding or finishing operations—and it's very simple to operate.

Write for complete information—and arrange for a demonstration in your own plant. You may be surprised to learn the many ways in which this instrument can save you money.



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Pat. App. For

"Unbrako" Socket Head Stripper Bolt with Knurled Head

"Unbrako" Socket Set Screw with *Knurled* Threads.

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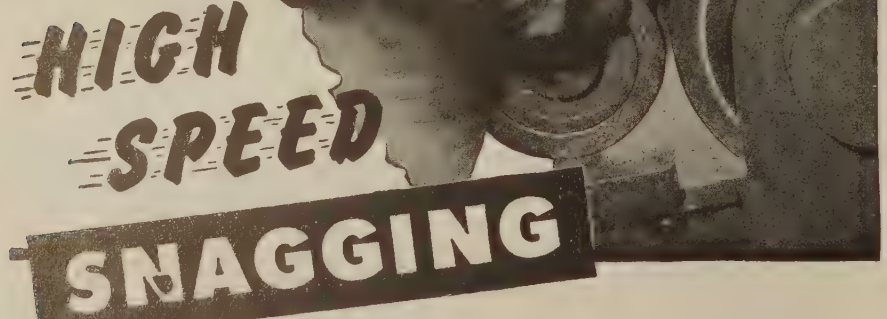

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to lease by Western Electric to Dec. 14, 1950; general manu turing plant, DeKalb, Ill., for subject to lease by General E tric Co. to Jan. 31, 1951; ger manufacturing plant, Sagi Mich., for sale subject to leas Eaton Mfg. Co., to Feb. 28, 1 and general manufacturing pl St. Paul, Minn., for sale subjec lease by Engineering Research sociates, Inc., to March 14, 19

Simplified Practice for Tacks, Nails Sugges

Washington

• • • **The National Bureau** Standards has announced tha proposed revision of Simpl Practice Recommendation R4 Cut Tacks and Small Cut Nail being distributed to producers, tributors and users for accept or comment, or both.

The proposal would establish plified lists, under two ger headings, of types, sizes, finis and package sizes of cut tacks small cut nails, as a standar practice for the industry. The lowing kinds of tacks and nails covered in the hardware list; poster, carpet, upholsterer, t mers, gimp, basket tacks, ba nails, trunk tacks, trunk nails, per tacks, clout nails, hide double pointed tacks. The finders list covers the follow cobblers, extra iron clinching, H garian nails, channel nails, nails, hand shoe tacks and nails.

Mimeographed copies of the posed revision may be obta from the Commodity Stand Div., National Bureau of Stand Washington 25.

Reports 6-Month Profit

Chicago

• • • **Standard Forgings** Corp cently reported net profit of $ 072 for the 6 months ended Jun 1948, equivalent to $1.60 a shar 266,000 shares of $1 par value c mon stock outstanding, comp with net profit of $227,698 and a share on the same numbe shares for the corresponding pe of 1947.

Net sales for the 6 months of totaled $6,791,783 compared sales of $5,403,206 for the co sponding period of the prece

r. In the first quarter of 1948 s amounted to $3,608,000 and in second quarter ended June 30, 83,783. In the corresponding ods of the preceding year the s figures were $2,493,942 and 09,264.

The backlog of orders at the sent time is slightly in excess $9 million," Roy W. Clansky, sident, stated.

tish Must Cut Auto Costs to Be Competitive

don

• **Latest ambassador** of trade return from the United States n the message that Britain st cut its car production costs ir Graham Cunnigham, chair- n and managing director of ples Safety Glass Co.

f the British motor car indus- is to retain its hold in the ex- market," he said, "it is es- ial that it should cut costs to utmost."

r e a t e r interchangeability of ts must be achieved in order to ease mass production and thus ease costs," he declared.

ir Graham pointed out that it not uncommon in America to the same kind of windshield back light to be used in several s produced models. He urged ish manufacturers to follow same procedure.

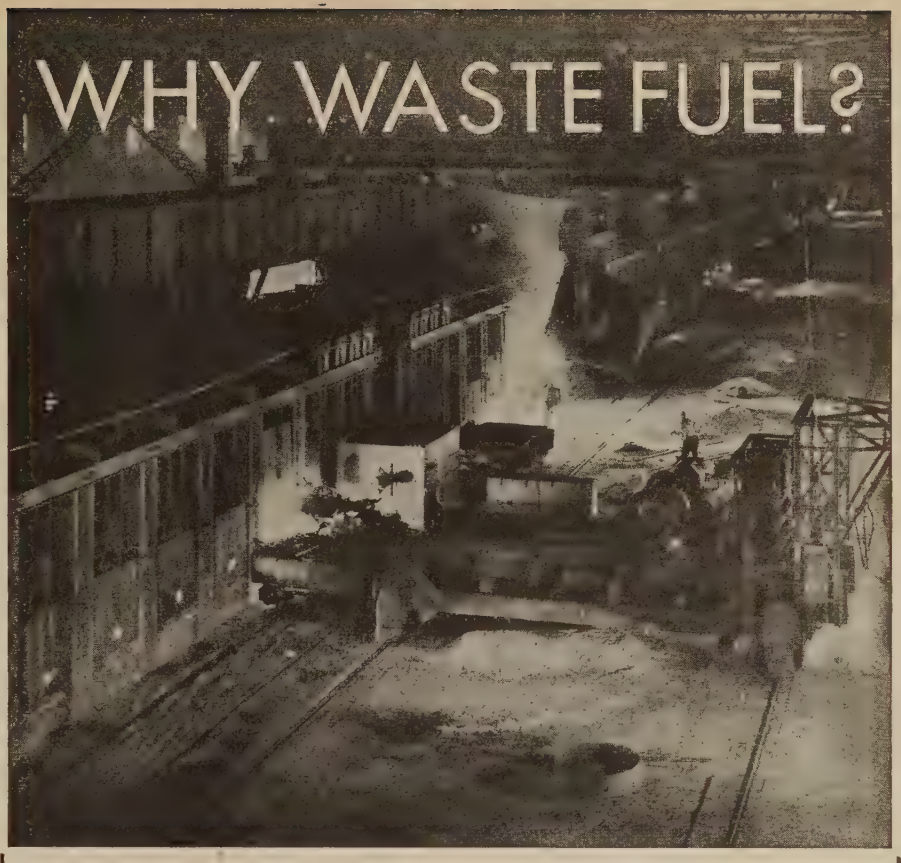
By an increase in standardiza- of several models", he added, st of the safety glass could be ced, and of course, the same ciple could be applied to other essories."

ntroller Institute Has Has Officer Elections

k York

• **Hobart M. Brown,** assistant etary and treasurer of the To- Steel Products Co., has been ted vice-president of the Toledo trol of the Controllers Institute America.

I. D. Wells, comptroller of the negie-Illinois Steel Corp., was ilarly honored by the institute's sburgh control, which also ted William F. Dickson, account ning supervisor of the U. S. el Corp.; Paul E. Shroads, assist- treasurer of the National Steel p. and E. L. Resler, assistant troller of the Jones & Laughlin el Corp., to its board of directors. regory M. Layne, controller of Mid-States Steel & Wire Co.,



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Crawfordsville, Ind., is the new treasurer of the Indianapolis control.

At the recent annual meetings of their respective controls, the following industry executives were chosen directors: Cornelius Bolen, secretary and treasurer of the Converse Bridge & Steel Co., Chattanooga; James E. Brown, treasurer of the Cooper-Bessemer Corp., Mount Vernon, Ohio (Columbus control); Kenneth B. Coates, treasurer of the Great Lakes Steel Corp., and Rodger A. Yoder, secretary-treasurer of the Detroit Steel Corp., both of Detroit; Joseph B. Lanterman, comptroller of American Steel Foundries, Chicago and Laurence D. Luey, comptroller of the Connors Steel Co., Birmingham.

Constructs New Atom Smasher for Canada For Nuclear Research

Schenectady, N. Y.

• • • **The General Electric Co.** is buildinga 70-million v synchroton, a type of atom smasher, for Queens University, Kingston, Canada, according to company spokesmen here.

The synchroton will be modeled after a machine developed by GE some time ago and will be used by the Canadian institution for nuclear research.

Like the betatron, the synchroton accelerates electrons in the atom smashing process. The machine is one of the newest among the particle accelerators, according to W. P. Simpson who is directing engineering in its construction at General Electric. He pointed out that there are significant advantages in this new type, particularly for the development of higher voltage machines.

Basic feature of the synchroton is the principle of phase stabilization. This means that accelerating electric impulses occur at exactly the right time to boost electrons as they circulate in the machine's acceleration chamber. This provides a tendency for automatic synchronization.

Although the electro-nuclear device utilizes an electro-magnet, the main acceleration is provided by an electrostatic field. When the electrons have been accelerated by magnetic induction to a magnetic energy of 2 million electron-volts, a radio frequency oscillator on automatically.

The oscillator is connected gap on the inside of the sync ton accelerator, and circling trons receive an increase in en each time they go past.

Dr. Furman Gets First Fisher Chemistry Aw

St. Louis

• • • **Dr. N. Howell Furman,** sell Wellman Moore professo chemistry at Princeton Unive will receive the first $1000 F award in analytical chemistr the midwest session of the 114 tional meeting of the Amer Chemical Society here on Sep according to Dr. Charles A Thomas, president of the soc

Prof. Furman has developed eral important techniques for preparation of materials requ in atomic bomb projects. He is ing honored for his substa contributions to analytical ch istry, particularly his studies electrometic methods in chem analysis.

The award was established year by C. G. Fisher, presider the Fisher Scientific Co., P burgh, to recognize and encou important contributions to the ence of analytical chemistry.

Prof. Furman is now a consul to the U. S. Atomic Energy C mission. He began in 1942 to velop techniques for prepa bomb project materials. His tributions include methods of s pling and analysis in the pro tion of pure uranium metal, timating traces of metals in va substances and the developme an ether extraction process for preparation of uranium oxide

Forms Additional Group

Cleveland

• • • **A group of Foundries** in I ana and eastern Illinois h constituted themselves the Ind apolis Group of the Gray Founders' Society at a recent m ing of the executives of the f dries. This action represents 27th foundry group establishe the society in the last 9 mont

Harry D. Caylor, president, G. Potts & Co., Indianapolis, elected chairman of the g Charles H. Cochran, presid Crawfordsville Foundry Co., C fordsville, Ind., was made

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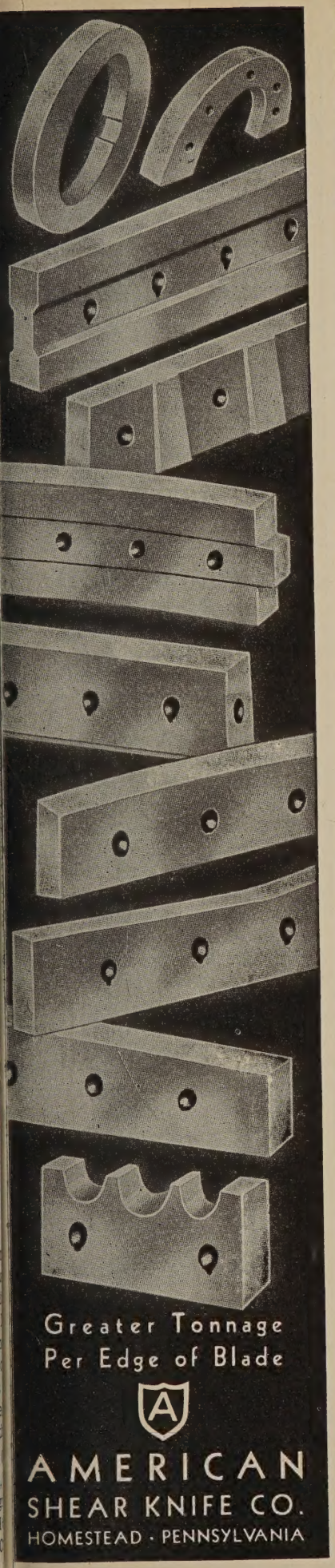

chairman, and Leo R. Meyer, Interstate Foundry Co., Inc., was named secretary-treasurer.

At the meeting R. L. Collier, president of the society, outlined its current operations and future plans, laying stress on the need for better merchandising methods in marketing gray iron components and in improving foundry practice and metal quality. He sketched recent metallurgical developments which could easily revolutionize gray iron as it exists today.

Describes the Successful Reduction of Iron Ore

Washington

• • • **Successful reduction** of iron ores to sponge iron in a continuously-operated alloy-steel shaft furnace, using hydrogen or water gas as the reducing agent, is described in a new publication released by the Bureau of Mines.

Construction details of the equipment along with test data are included in the bureau report, which was prepared by Edward P. Barrett, chief, and Carl E. Wood, chemist, at the Minneapolis branch office of the Metallurgical Div.

A free copy of the publication, Report on Investigations 4305, "Production of Sponge Iron: Gaseous Reduction of Iron Oxide Glomerules in a Shaft Furnace," may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13.

Holds Annual Meeting

Chicago

• • • **The National** Conference of Industrial Hydraulics which is being sponsored jointly by the Armour Research Foundation and the Graduate School of the Illinois Institute of Technology will be held here from Oct. 20 to 21.

This is the fourth annual meeting of the group.

WAA Sells Buildings

Washington

• • • **Globe-Union, Inc.,** Milwaukee, has purchased the three government-owned buildings and equipment at the Globe-Union plant for $175,000, according to War Assets Administration.

The firm plans to continue commercial manufacture of steatite, a

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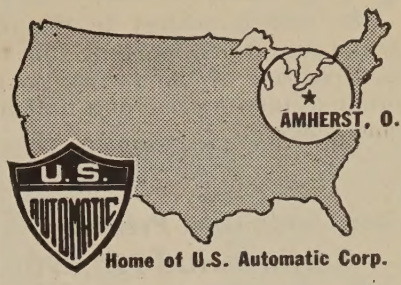

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high-frequency insulation for radio and electronic equipment, which it produced during the war.

The sale is subject to the national security clause, providing for reconversion of the facility to its original state in event of a national emergency.

Railroads and Private Carlines Had 125,290 Cars on Order Aug. 1

Washington

• • • **All railroads** and private carlines had 125,290 new freight cars on order as of Aug. 1, 1948, the Assn. of American Railroads has announced. The number on order on Aug. 1, 1947, was 117,267.

Of the total number, Class I railroads and railroad-owned private-controlled refrigerator car companies on Aug. 1 had 108,542 new freight cars on order. On Aug. 1, 1947, there were 102,998 on order.

New freight cars on order by Class I railroads and railroad-owned private-controlled refrigerator companies on Aug. 1, 1948, were as follows: 29,077 box including 28,727 plain and ventilated and 350 automobile box cars; 48,943 hopper including 3950 covered hoppers; 19,198 gondolas; 3679 flat; 6153 refrigerator; 600 stock, and 892 miscellaneous freight cars.

Of the total number of new freight cars which Class I railroads on Aug. 1 had on order, 32,523 will be built in railroad shops and 76,019 in outside shops.

Class I railroads also had 1628 locomotives on order on Aug. 1, 1948, compared with 815 on order on Aug. 1, 1947. The number for which orders had been placed on Aug. 1, 1948, included 119 steam and 1509 Diesel locomotives, compared with 29 steam, four electric and 782 Diesels one year ago.

Class I railroads and railroad-owned private-controlled refrigerator car companies put 58,892 new freight cars in service in the first 7 months of 1948, compared with 26,174 in the same period in 1947. In the month of July 1948, the railroads installed 7974 new freight cars, compared with 5439 in July 1947.

Those installed in the 7 month period this year were as follows: 23,829 box cars which included 22,765 plain and ventilated and 1 automobile; 24,551 hopper includ 1205 covered hoppers; 5750 g dolas; 4243 refrigerator; 48 flat; stock and 221 miscellaneous frei cars.

Also, 762 new locomotives v put in service in the first 7 mon of 1948 of which 28 were steam, electric and 730 Diesel. New l motives installed in the same pe last year totaled 482, of which were steam, two electric and Diesel.

Class I railroads and railro owned private-controlled refri ator car companies in the fir months of 1948 retired 44,717 fre cars of which number 7920 v retired in the month of July. the same 7 month period of 1 there were 34,383 retired.

J & L Provides Houses fo Their Alliquippa Work

Pittsburgh

• • • **John W. Galbreath &** Columbus, has undertaken a gram designed to relieve Alliq pa's critical housing shortage, cording to spokesmen of the J & Laughlin Steel Corp. here.

The new building corpora headed by Mr. Galbreath will the Alliquippa community homes immediately. It may mately provide from 400 to 500 h units. The plan will be known Cooper Farms.

Units will be processed thro the FHA offices here. This insure reasonable down paym and easy monthly installments a period of years.

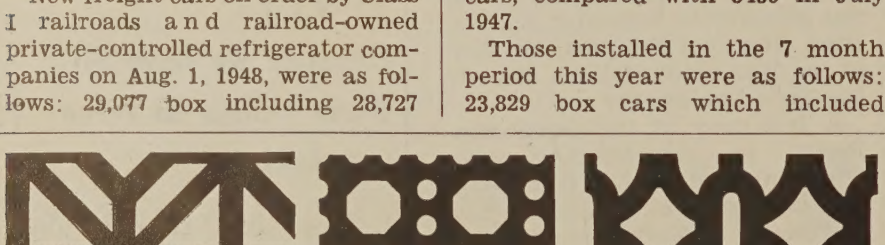
Several other large scale proj are now under way by the breath company. These includ 400-home project in Lorain, O a bachelor home project at Ga and a 100-home project at Frank Pa.

Develops New Markets

London

• • • **A contract** for 225 sets prefabricated bus-skeleton com nents has been received from Bombay Provincial Government Metal Sections, Ltd., of Oldb Birmingham, a subsidiary of T Investments Ltd.

Important export markets being developed for this new B ish product. Consignments of b skeletons have already been s to Argentina, Brazil, Austra



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ne, Egypt and Spain.
The bus-skeletons consist of
ndarized steel tubes, prefabri-
ted steel and aluminum alloy
ctions, and sheet metal parts.
A single-deck bus-skeleton can
assembled in 12 man-hrs with a
pct reduction in the weight of
e vehicle being achieved.

hemical Co. Purchases Louisiana Ammonia Plant

ew York

• • • **The War Assets** Administra-
on and Mathieson Chemical Corp.
ve concluded an agreement for
e chemical company to purchase
e ammonia plant and ammonia
idation facilities at Lake Charles,
., according to Thomas S.
chols, Mathieson president and
airman of the board.
The purchase price was reported
be $7,063,300.
This purchase will establish Ma-
ieson as a major producer of
nthetic ammonia, which today
one of the important sources of
trogen for the production of fer-
izer and other nitrogen products.
he move is also in line with Ma-
ieson's policy of expanding its
erations and broadening its field
chemical activity, Mr. Nichols
ated.
Built by Mathieson for the De-
nse Plant Corp., the plant was
ased to the company and produc-
on began in the fall of 1944, the
tire output going into the manu-
cture of high explosives for the
mainder of the war period.
After the war, at the request of
e government, Mathieson con-
nued to operate part of the plant
r the production of nitrogen gas,
ed in purging the Big-Inch pipe-
ne preparatory to placing the lat-
r in standby condition.
Early in 1947, Mathieson negoti-
ated with the government a long
rm lease for the entire plant fa-
lities and after an extensive re-
abilitation program the ammonia
ant was put into full operation.

NCO Shows Profit

ew York

• • **The report of** The Interna-
onal Nickel Co. of Canada, Ltd.,
nd subsidiaries for the 6 months
nded June 30, 1948 shows net profit
$20,235,006 after all charges,
uivalent, after preferred dividend
equirements, to $1.32 a share on
ne common stock.

This compares with net profit of $16,460,339, or $1.06 a common share, in the corresponding period a year ago.

In the quarter ended June 30, 1948, net profit was $9,819,301, equal to 64c a share on common, comparable with $10,415,705, or 68c a common share, in the preceding quarter.

A.C.S. Adds New Section

Washington

• • • **A new local** section of the American Chemical Society has been established at Richland, Wash., where plutonium, principal source of atomic energy, is manufactured, according to Alden H. Emery, executive secretary of the society.

The new group will be known as the Richland section, and will consist of chemists and chemical engineers of Benton and Franklin counties in the state of Washington.

With a charter enrollment of 102 members, the unit becomes one of 127 local sections of the American Chemical Society, the largest professional association of scientists in the world. The society has more than 58,000 members in the United States, Hawaii and Puerto Rico.

Dr. Robert Lee Moore of the Technical Dept. of the General Electric Co.'s Hanford Works, Richland, has been appointed the first chairman of the section, which has headquarters in that town. In 1943, Richland was a hamlet of 242 persons. But in the 5 years since the establishment of the Hanford Works there, its population has increased to more than 15,000.

Increases Production

Cleveland

• • • **Manufacturing** facilities of Parker Appliance Co.'s Pacific Division will soon be doubled, according to S. B. Taylor, company president, who announced the purchase of the Los Angeles plant of Air Associates, Inc., Teterboro, N. J., last week.

Price was understood to be in excess of $300,000.

Completed late in 1941, the single-story building covers approximately 42,000 sq ft of a 5-acre plot having a 375 ft frontage on Century Boulevard in the industrial district adjacent to the Los Angeles Municipal Airport (Mines Field) and close to plants of Douglas Aircraft and

Here's how one plant saved production hours and dollars — simply by reviewing their materials handling operations.

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ASSOCIATION OF IRON & STEEL ENGINEERS

1010 Empire Building, Pittsburgh, Pa.

ATlantic 6323

North American Aviation.

H. E. Schroeder, Pacific Division manager for Parker, will continue as head of the company's expanded operations, Mr. Taylor said.

Employment in the new plant will be stepped up just as rapidly as the additional new machinery and equipment can be secured and installed.

Activates Jet Engine Plant in Kansas City

Philadelphia

• • • **D. W. R. Morgan,** vice-president in charge of steam turbine and jet engine operations of the Westinghouse Electric Corp. here has confirmed the announcemnt of the office of the Secretary of Defense that, under a joint plan between Westinghouse and the Navy, the company will reactivate and operate the Naval Industrial Reserve plant at Kansas City, Mo.

The plant will be used for the production of axial-flow jet aircraft engines, a design which Westinghouse pioneered in this country.

Initial steps for reactivating the plant, built during the war and formerly operated by Pratt & Whitney Aircraft Div. to build reciprocating engines for planes, are already under way. Some months will be required, however, to complete the layout, supply machine tools, test cells and auxiliary services, and install equipment necessary for manufacturing purposes.

Under present plans, some 1,500 to 2,000 employes will be required after machinery is installed. This figure may rise eventually to 5,000 depending on the progress of development and the needs of the armed services. Wherever possible local people will be hired. It will be some time—possibly months—before hiring will begin.

To Sponsor Lectures On Industrial Health

Detroit

• • • **A series of 14** lectures covering special topics in industrial health, hygiene, safety will be given at the Rackham Educational Memorial Bldg., Detroit, commencing Sept. 9. The course is sponsored jointly by the University of Michigan Extension Service and Michigan Department of Labor.

Among the subjects to be discussed are: Industrial Hygiene including lead poisoning; silica and silicosis; metal processing including grinding, buffing, polishi welding, degreasing etc; gas mists and fumes; dermatitis; pla sanitation and housekeeping; a mospheric purification; machi safe guarding and safety standar

Arrangements for the cour have been made by Dr. G. C. Ha rold, Industrial Health, Hygie and Safety Engineer. Members the faculty include leaders Michigan Industry in addition the faculty of Wayne Universi Several representatives of Nation State and City Government B reaus will also participate.

The lectures will be given Thursday nights from 7:00 9:00 P.M.

N.A.D.A. to Hold Annual Convention on West Coa

Detroit

• • • **Attendance at** the 1949 A nual Convention of the Natio Automobile Dealers Assn. to be he January 24-27, 1949 in San Fra cisco is expected to break all pa records, according to Ray Chambe lain, N.A.D.A. Convention Manag

In addition to technical sessio of the assembled automobile dea ers, there will be exhibited simu taneously tools, machinery, equi ment, systems, etc., which au dealers use in their business. T National Equipment Exposition w be held in Larkin and Polk Halls a joining the Civic Auditorium whe N.A.D.A. meetings will be held.

Included in the broad range subjects to be discussed at the 19 convention are: Highway Safe Production, Economic Trends, Dea er Management, Employee Relatio and Consumer Relations.

A service symposium will also held.

Equipment exhibited at the Sho will be limited to devices that a not resale items.

Buys 51-Year-Old Plant

Buffalo

• • • **Cincinnati interests** head by Sidney G. Rose have purchas the 51-year-old Rice & Adams Cor of Buffalo, dairy machinery man facturer.

An official spokesman said th plant would continue to opera without change in personnel or a tive management. He also adde that the company had a year backlog of orders.